RRG Technical Seminar

Layer 2 Draft – Last Updated on May 25, 2005

The Structure Group
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Houston, TX 77042

THE STRUCTURE GROUP

May 25 Agenda

The agenda for May 25 is…

Subject	Time
Welcome	8:30 – 8:35am
Introduction	8:35 – 8:45am
How Did We Get Here?	8:45 – 9:00am
TSLG Assignment	9:00 – 9:15am
Regional Problems	9:15 – 10:00am
Break	10:00 – 10:15am
Design Overview	10:15 – 11:00am
Day-in-the-Life	11:00 – 11:45 am
Lunch	11:45 – 12:45 pm
Feature Details	12:45 – 3:45 pm

May 26 Agenda

The agenda for May 26 is…

Subject	Time
Tying It All Together	8:30 – 9:15am
TSLG's Top 8 Issues	9:15 - 9:45am
Conclusions	9:45 – 10:00am
Question & Answer	10:00 – 11:00am

Outline

- Welcome
- Introduction
- How Did We Get Here?
- TSLG Assignment
- Regional Problems
- Design Overview
- Day-in-the-Life
- Feature Details
- Tying it All Together
- TSLG's Top 8 Issues
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The objectives of the May 25-26 technical seminar are…

- Review the Grid West conceptual framework
- Describe the proposed Grid West services
- Describe the improvements this design offers
- Obtain feedback
- Answer questions

To make the best use of our time today, the TSLG has established the following ground rules…

- TSLG will review the conceptual framework only
- TSLG will take questions at the end of each section
- Please save detailed questions until the end
- Attendees can submit written questions by June 3
- Responses will be posted on June 24

Solutions to these problems must also meet a challenging set of regional conditions…

- Maintain existing physical transmission rights while providing comparable service
- Preserve current scheduling flexibility
- Accommodate hydro system complexity

Given the current transmission conditions and challenges, several "burning questions" exist…

- Are the basic features feasible?
- Can the basic features stand alone?
- Will they free up additional transmission capacity?
- Can they create new opportunities?
- Will it preserve existing rights?
- Will it lower the cost of imbalance energy?
- Will customers benefit from regional coordination?

Today you are going to hear about the proposed Grid West conceptual market design. Specifically, the TSLG will describe how this design will…

- Provide a single view of the transmission system
- Make better use of the existing transmission system
- Improve operational efficiency
- Centralize regional planning efforts
- Provide an economic means for procuring the CCA balancing and reserve needs
- Preserve existing transmission rights while providing an opportunity to trade them
- Provide comparable service

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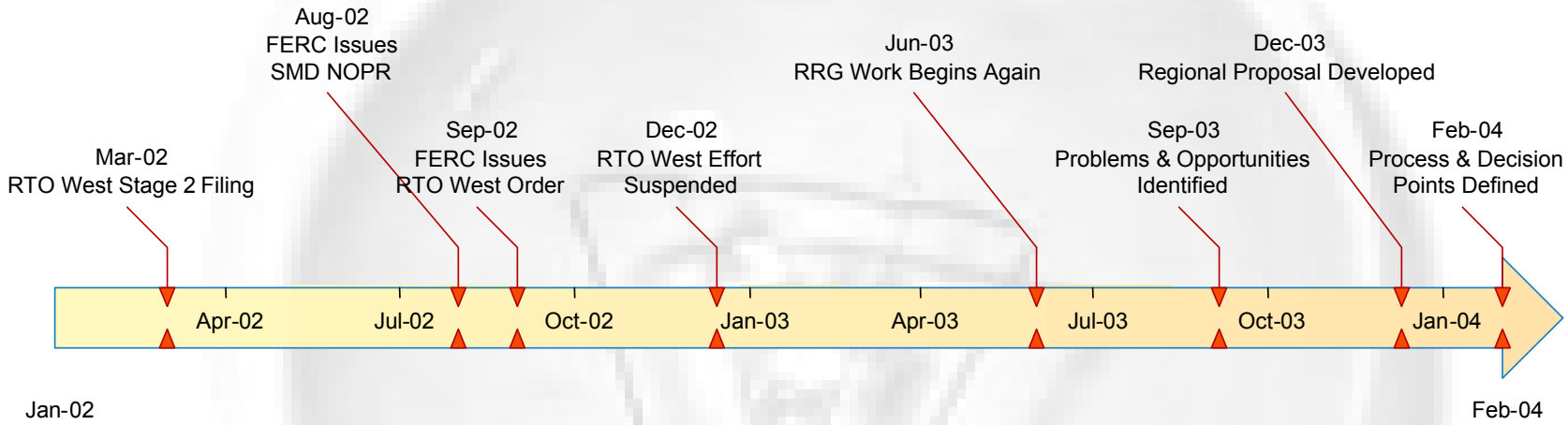
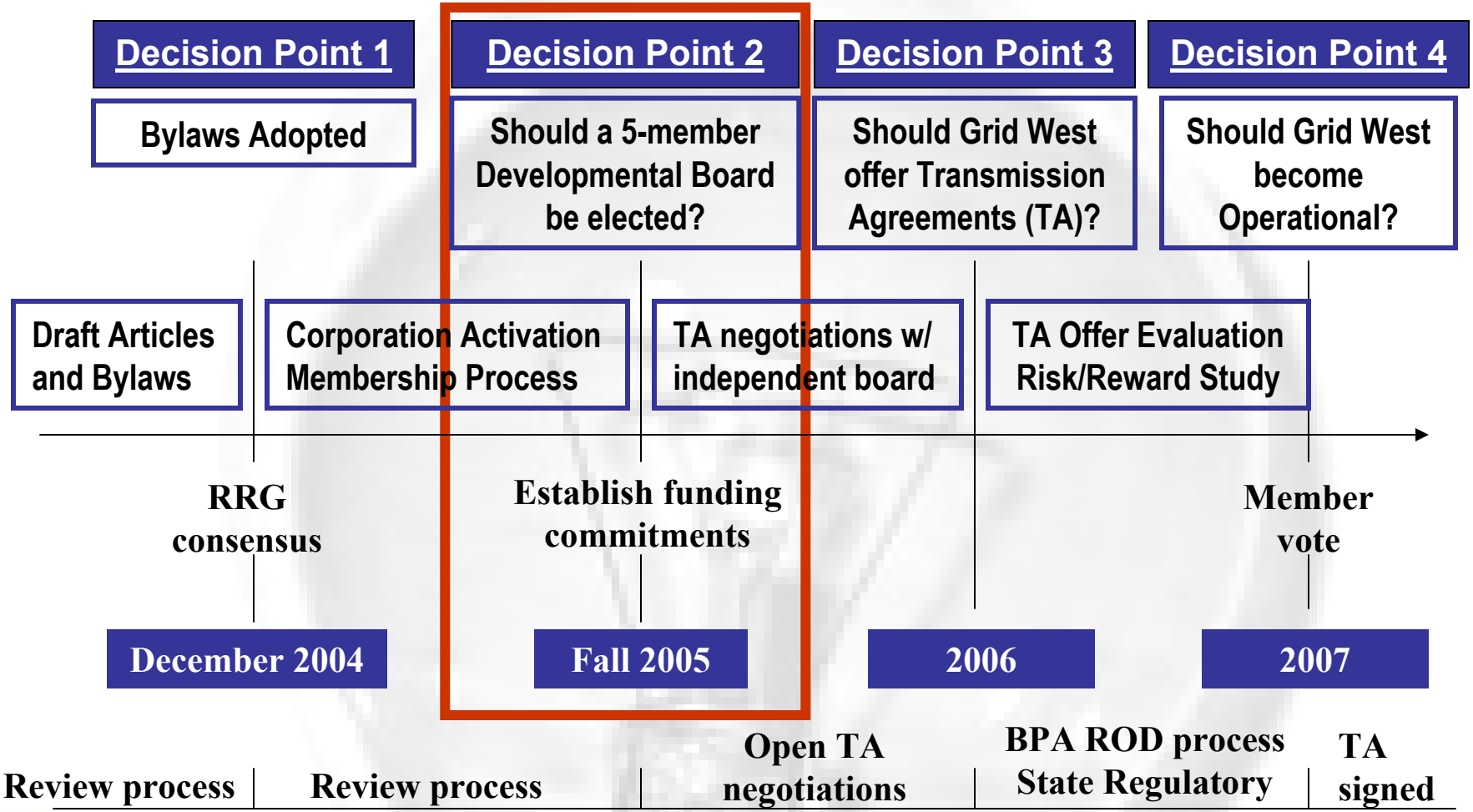
How Did We Get Here?
A Brief History

The following is a brief history of Grid West from the RTO West Stage 2 filing to the current Decision Point process…

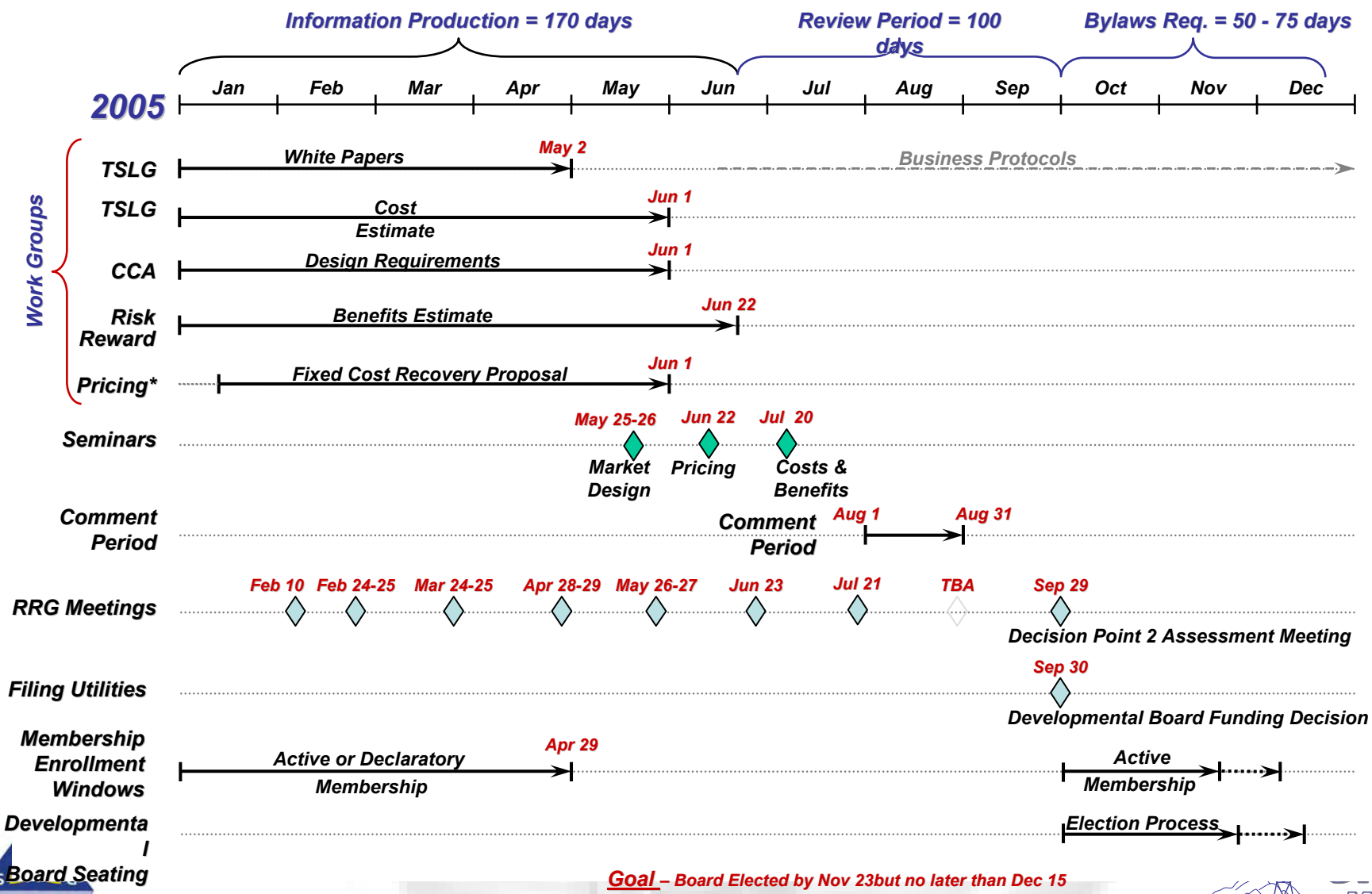


How Did We Get Here?
Decision Point Timeline



Note: Dates shown are the best current estimates and subject to change .

How Did We Get Here?
2005 Timeline to Board Seating



Goal – Board Elected by Nov 23but no later than Dec 15

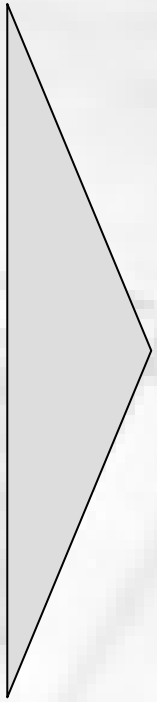
How Did We Get Here?
The Components

The following components are input into the decision point two process…

Conceptual Market Design Report
- Overview paper
- White papers

Pricing Report
- Long-term service
- Grid Management

Risk Reward Report
- Benefits
- Cost estimates



Decision Point 2

Should a 5-member Developmental Board be seated?

Should the TOs sign a two-year funding agreement?

The following is a brief progress report on the various components…

Market Design Update
- May 1 - Layer 2 Design Complete
- May 13 - White Papers Posted
- May 25-26 - Design Seminar Scheduled

Pricing Update
- June 22 – Pricing Seminar Scheduled

Risk/Reward Update
- July 20 – Risk/Reward Seminar Scheduled

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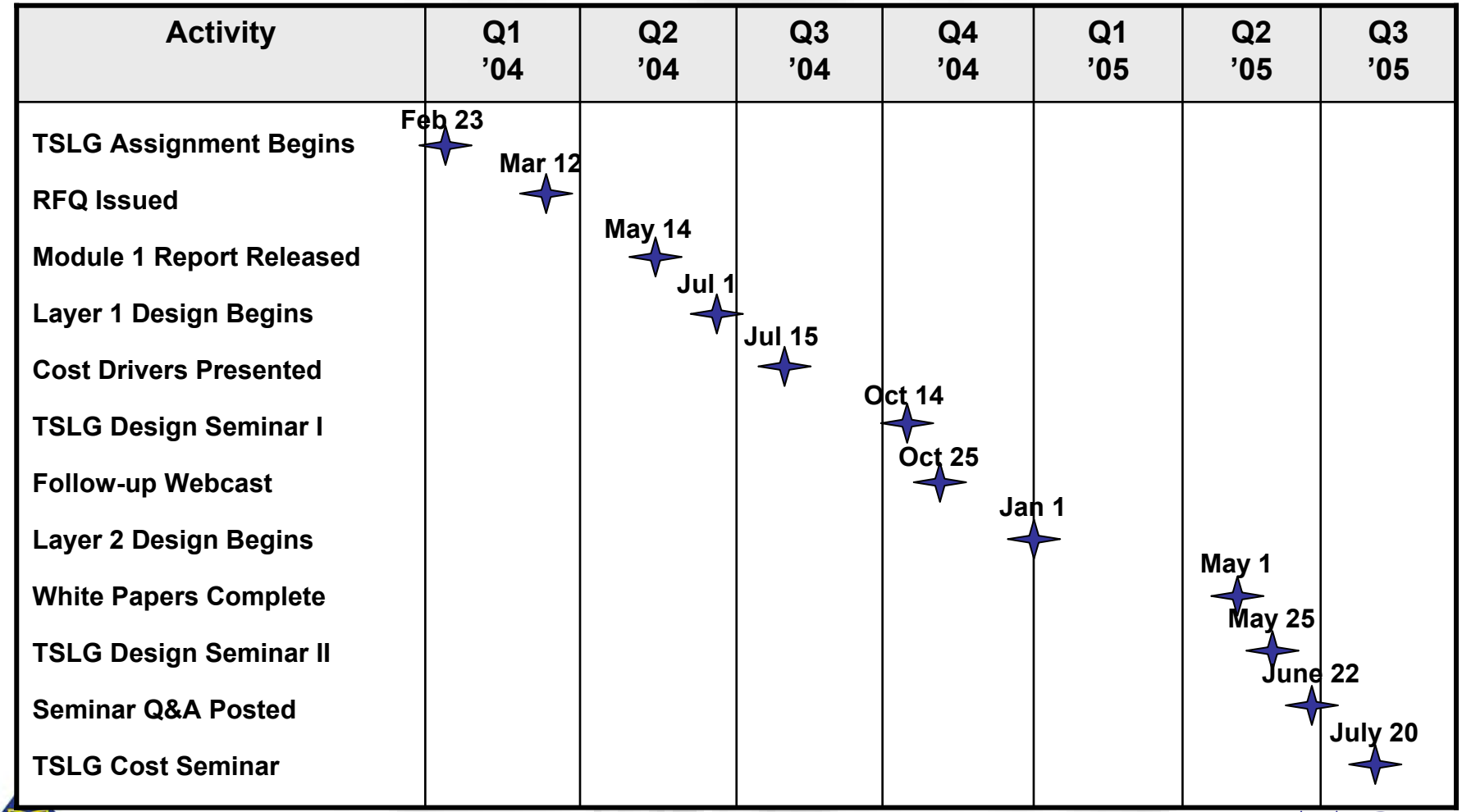
The Structure Group was asked to support the following activities…

- Development of a conceptual market framework
- Development of a bottom-up cost estimate
- Development of a consolidated control area design

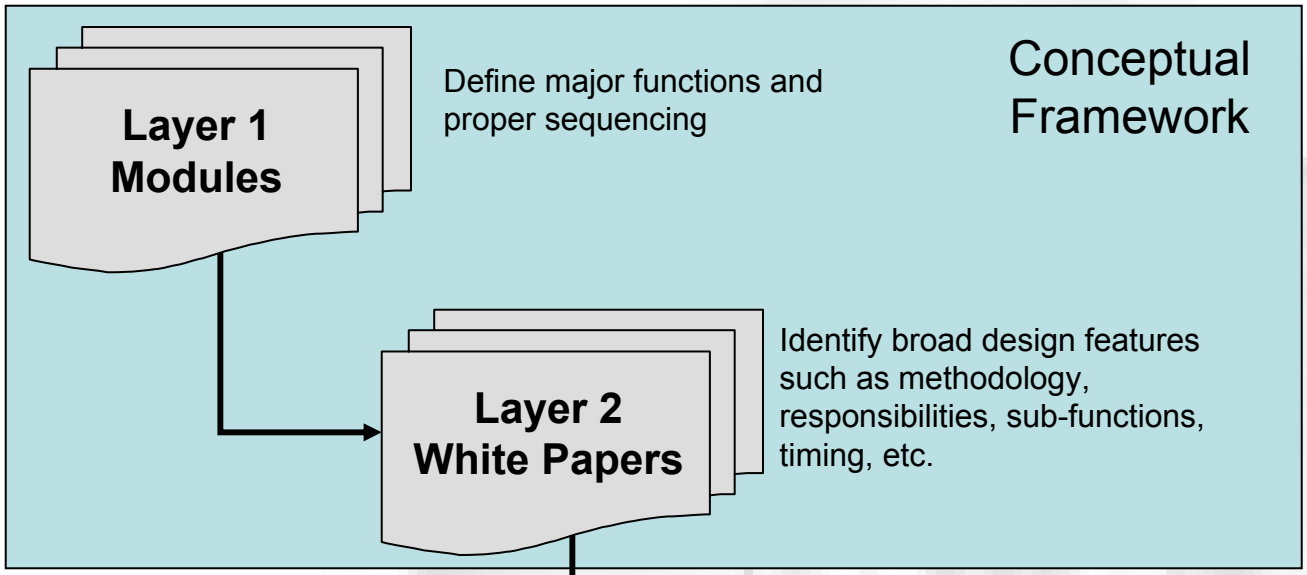
TSLG Assignment
The Team

Name	Company
Aleka Scott	PNGC Power
Carol Opatrny	Opatrny Consulting, Inc. for BCTC
John Canavan	NorthWestern Energy
Ed Groce	Avista Corporation
Chuck Durick	Idaho Power Company
Stefan Brown	Oregon PUC
Eric King / Tim Smith	Bonneville Power Administration
Wally Gibson	Northwest Power and Conservation Council
Linc Wolverton	Industrial Customers of Northwest Utilities
Terry Mundorf	Western Public Agency Group
Paul Kroger	PacifiCorp
Alan Davis	Enventure for IPPs & Power Marketers
Paul Schmidt / Jim McMorran	Sierra Pacific Power
Jim Hansen	Seattle City Light

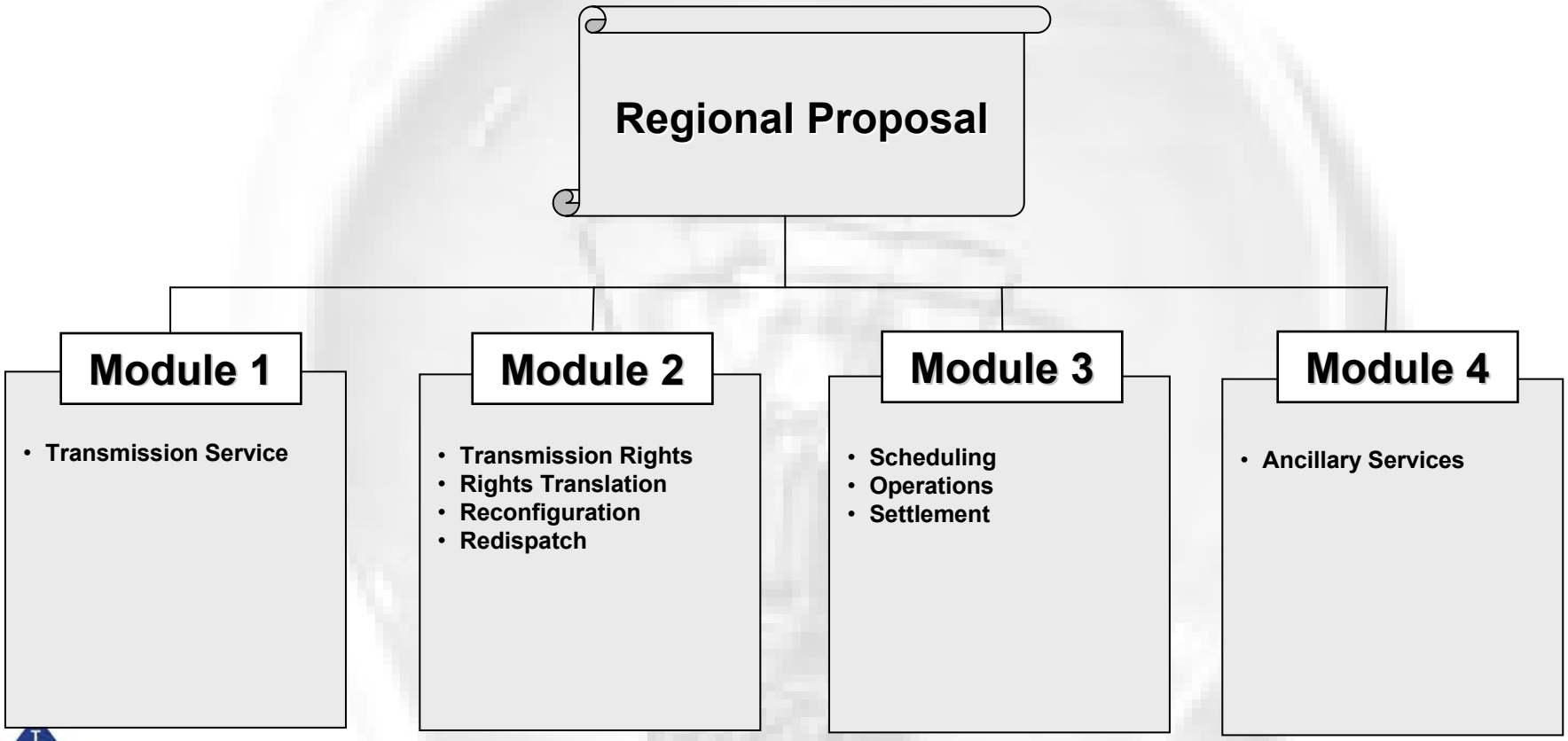
TSLG Assignment
A Year in Review



TSLG Assignment
A Layered Approach



The TSLG defined several "modules" to help identify the services Grid West will provide under this model…



The principles guiding the Platform Group's work were…

- Should be a clear improvement over the existing situation
- Each stage of the proposal should be workable in itself
- Each stage should allow further evolution of solutions to remaining problems

The Regional Proposal contains the following design boundaries...

- Balanced schedules are required
- Control area consolidation is voluntary
- Existing business practice flexibility is maintained
- Existing transmission rights can be voluntarily traded
- Region-wide markets are voluntary

In developing the set of white papers, the TSLG not only evaluated design options, but also….

- Identified technology requirements
- Identified organization requirements
- Benchmarked other transmission organizations
- Evaluated cost drivers

TSLG Assignment
White Paper Inventory

White Paper Overview: Grid West Market & Operational Design

White Papers

Module 1 *Transmission Service*	Module 2 *Rights Administration*	Module 3a *Scheduling*	Module 3b *Operations*	Module 4 *Ancillary Services*	Module 3c *Settlement*
1 *Planning & Capacity Expansion*	3 *Transmission Rights Reconfiguration Service*	7 *Market Information System*	11 *NERC Reliability Functional Model*	15 *CCA Reserve Market*	18 *CCA Settlement Metering*
2 *Tariff Administration*	4 *Day-Ahead Redispatch*	8 *Outage Coordination*	12 *Real-Time Monitoring*	16. *CCA Reserve Deployment*	19 *Settlements & Invoicing*
	5 *Bilateral Trading*	9 *Scheduling and Schedule Adjustment*	13 *Real-Time Balancing Service*	17 *CCA Participation in Reserve Sharing*	20 *Billing Dispute Resolution Process*
	6 *Rights Data Management*	10 *Transmission Losses*	14 *Emergency Operations*		

Reference Papers

21 *Congestion Management*

22 *Auction Pricing*

23 *Commercial Model*

24 *Grid West Seams Issues*

THE STRUCTURE GROUP

Grid West

The following terms are used throughout the design…

- **AFC** (**Available Flowgate Capability)** – Uncommitted capacity on a flowgate (a line or set of lines with a combined rating, i.e. a "rated system path")
- **Bid** – The submission of a request to purchase at or below a given price
- **Offer –** A request to sell at or above a given price
- **CCA** (**Consolidated Control Area)** – A voluntary consolidation of electric power systems bounded by interconnection (tie-line) metering and telemetry

The following terms are used throughout the design…

- **Grid West Managed Transmission System (GWMT)** – The transmission facilities over which Transmission Owners have granted Grid West authority to manage transmission capacity requests and usage by execution of a Transmission Agreement

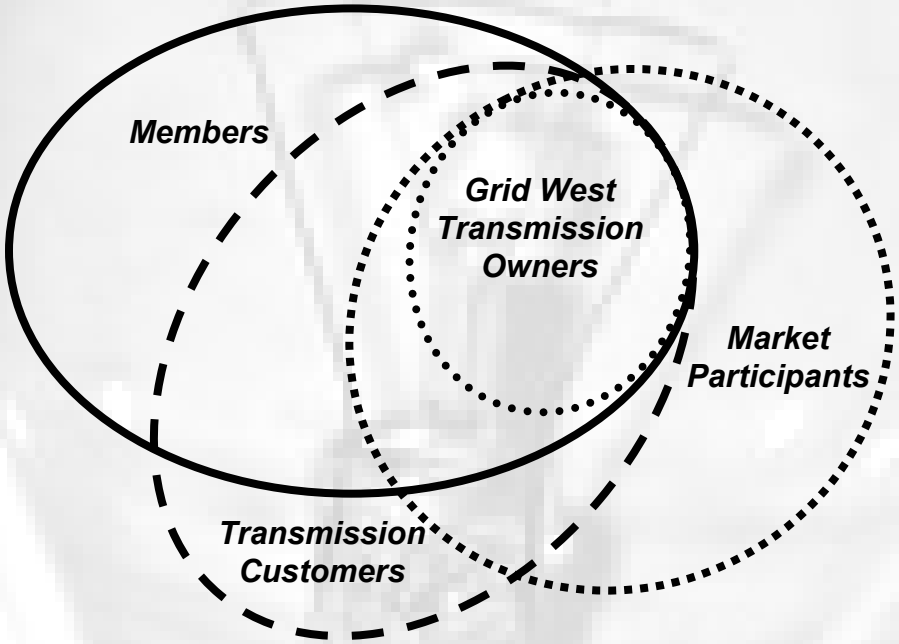
- **Inc/Dec (Incremental and Decremental) Offers** – Offers submitted in the Real-Time Balancing service to indicate willingness to increase (inc) or decrease (dec) a resource output for a given offer price

- **IWR (Injection-Withdrawal Right)** – The right to submit a day-ahead Injection-Withdrawal Schedule

- **RCS** (**Reconfiguration Service)** – A Grid West transmission rights service that provides for acquisition of IWRs either from AFC or from transmission rights released by sellers, through annual, monthly, intra-monthly auctions and daily auctions

The following terms are used throughout the design…

- **Member** – An individual or an entity that has chosen to become a member of the Grid West corporation under the terms of its bylaws
- **Transmission Customer** – An entity taking service under transmission service under the Grid West tariff or from a Grid West Transmission Owner



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Regional Problems
Background

A number of regional transmission problems have been identified…

- Underutilization of existing transmission capacity
- Operational challenges
- Lack of transmission expansion
- Need for open and transparent ancillary service markets
- Pancaking of rates
- Need for transparency and independence

Regional Problems
Underutilization of Existing Capacity

Although the system is fully subscribed, the transmission system is currently underutilized…

Identified Problem

- The contract path model fails to deal with actual flow effects
- There is no way to effectively trade transmission rights on a system-wide basis

Proposed Solution

- Move to a regional flow-based system of physical transmission rights, i.e., standardized injection-withdrawal rights (IWRs)
- Offer reconfiguration services to enable economically based trade in transmission rights

The transmission system has the following operational challenges…

Identified Problem

- When path/line loading problems occur, they are seldom known in advance but appear without warning in real-time
- Individual transmission owner curtailments either under or over correct

Proposed Solution

- Single-system view for issuance of transmission rights and scheduling
- Day-ahead evaluation of system loading when there is time for adjustment

Regional Problems
Lack of Expansion

Lack of transmission expansion continues to be a problem…

Identified Problem

- Requests for service must go through multiple providers
- Connection between regional planning and actual expansion is weak
- Cost recovery is uncertain without a means to establish long-term rights and consider beneficiaries

Proposed Solution

- A single queue for transmission service requests
- Clear definition of the long-term, system-wide rights obtained by funding expansion (IWRs)
- Planning with transmission adequacy backstops

Regional Problems
Need for Open & Transparent A/S Markets

There are currently few, if any, open and transparent A/S markets…

Identified Problem

- Need for open and transparent A/S markets (balancing & reserves)

Proposed Solution

- Voluntary consolidation of control areas
- CCA reserve market and a real-time balancing service
- Create open & transparency markets

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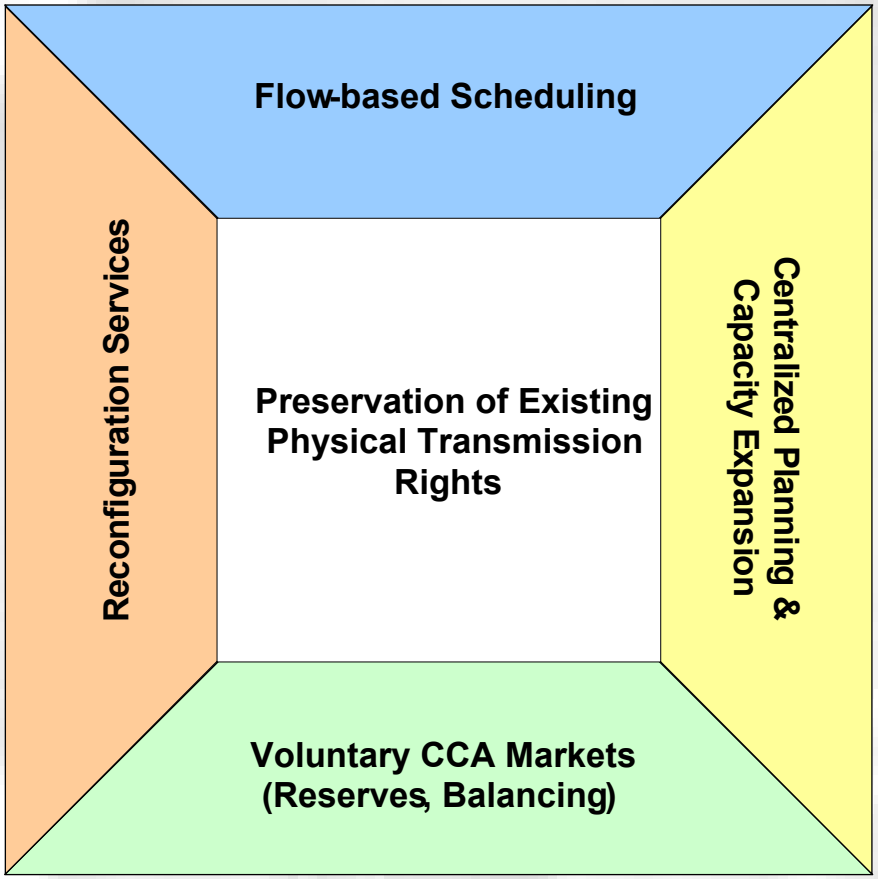
A major challenge in developing the conceptual market design was trying to create new opportunities while preserving existing transmission rights…

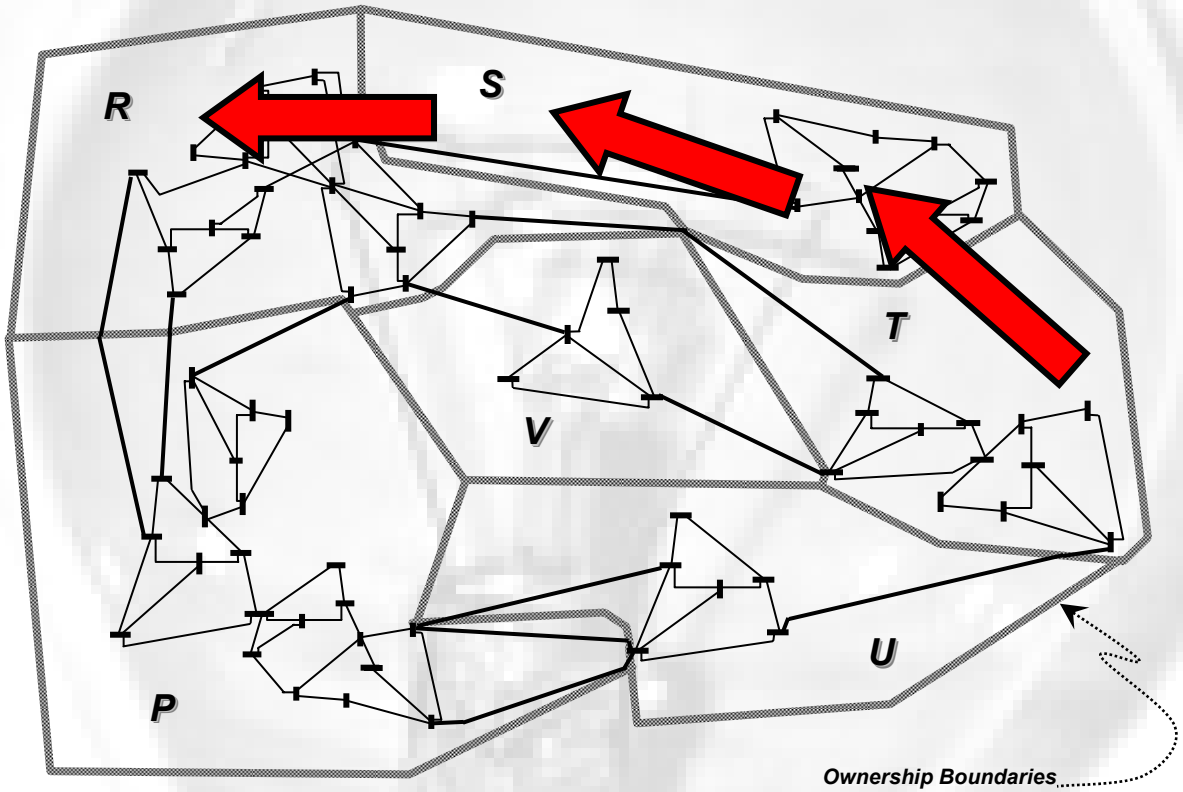


Flow-based Scheduling

Design Overview
Contract Path Overview

Today, transmission owners provide transmission services using an approach known as the contract path model…

Contract Path Past



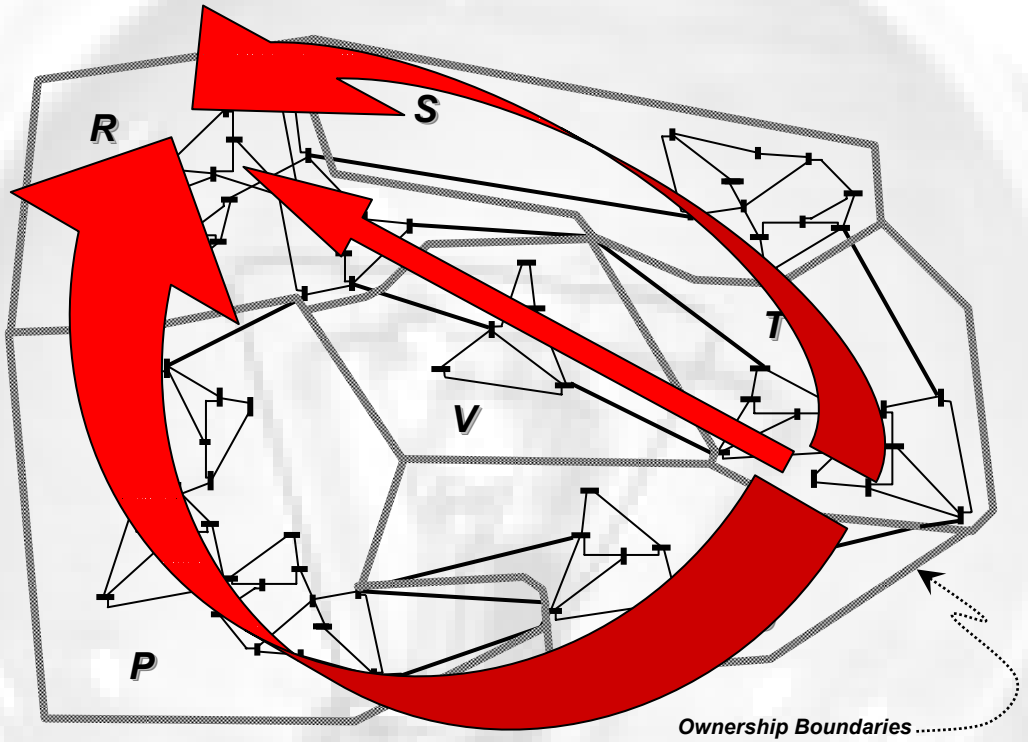
Design Overview
Contract Path Challenges

The following are challenges with the contract path model…

- Assumption that separate owners can act autonomously
- Network is more complex with more interconnections and less “margins” in the system
- Mitigation measures to the contract path model are not as effective as they need to be
- Unable to predict loop flow
- Underutilization of transmission capacity

Design Overview
Flow-based Overview

As a part of Grid West basic features, Grid West will move to a flow-based scheduling system…



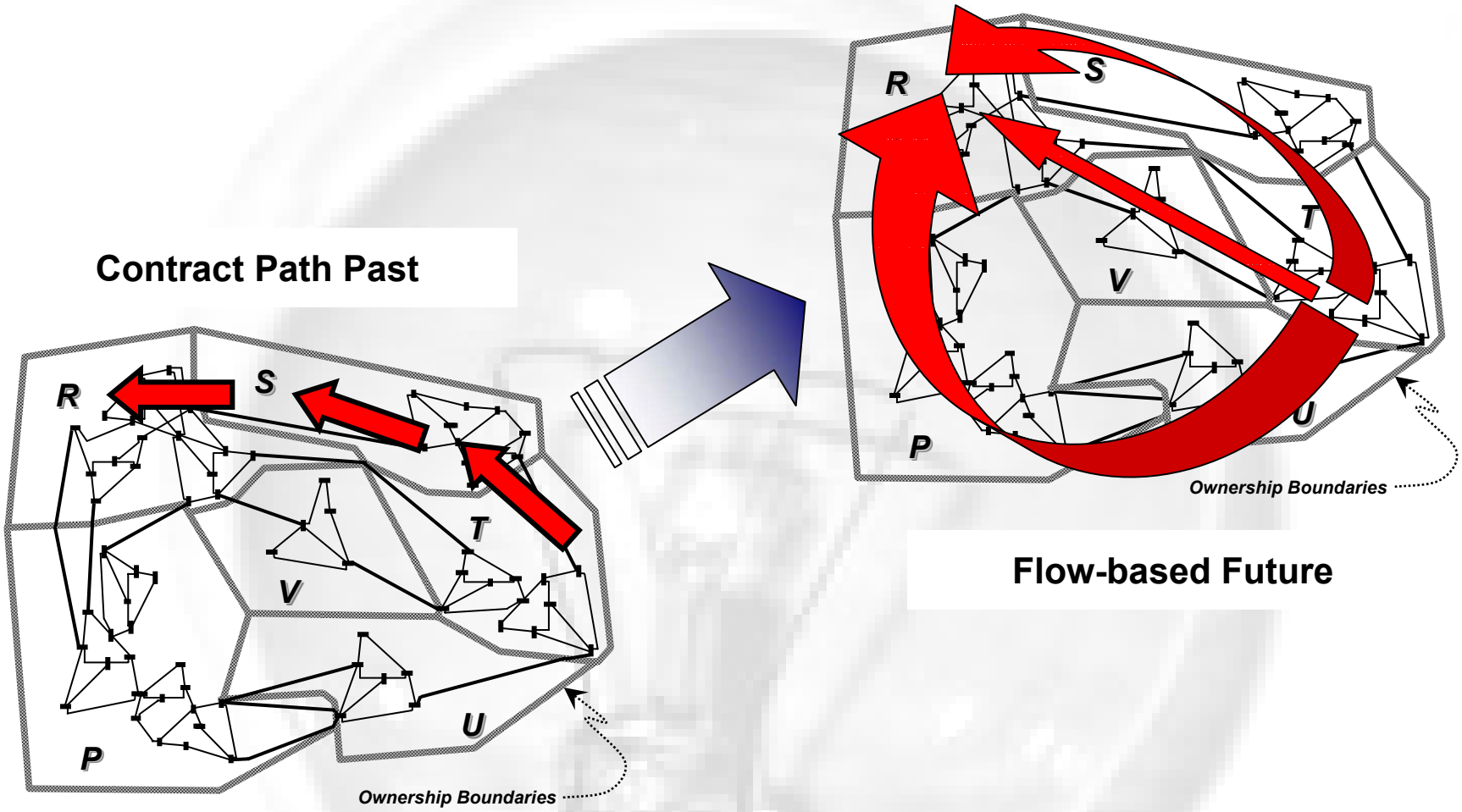
Flow-based Future

Design Overview
Advantages of the Flow-based Model

The flow-based model aligns usage with physical realities. In addition…

- Pre-existing obligations and agreements are unchanged in order to preserve pre-existing transmission rights
- A flow-based methodology with injection and withdrawal rights is adopted using a central administrator (Grid West) to manage the use of transmission capacity
- One-stop shopping for transmission services across the network is implemented through Grid West
- Transmission right reconfiguration services are implemented to enable better access to available capacity

Design Overview
Contract Path vs. Flow-based



Reconfiguration Service

Design Overview
Objectives

The reconfiguration service has the following objectives…

- Create a new medium-term market to allow customers to buy and/or sell transmission rights
- Create new commercial processes to obtain new or additional transmission service and/or rights
- Release additional transmission capacity
- Continue to honor all existing transmission rights and obligations

Design Overview
Obtaining Rights

A Grid West Participant has three ways to do more with (or obtain new) transmission rights…

- Capacity Expansion Service
- Reconfiguration Services
- Bilateral Trading

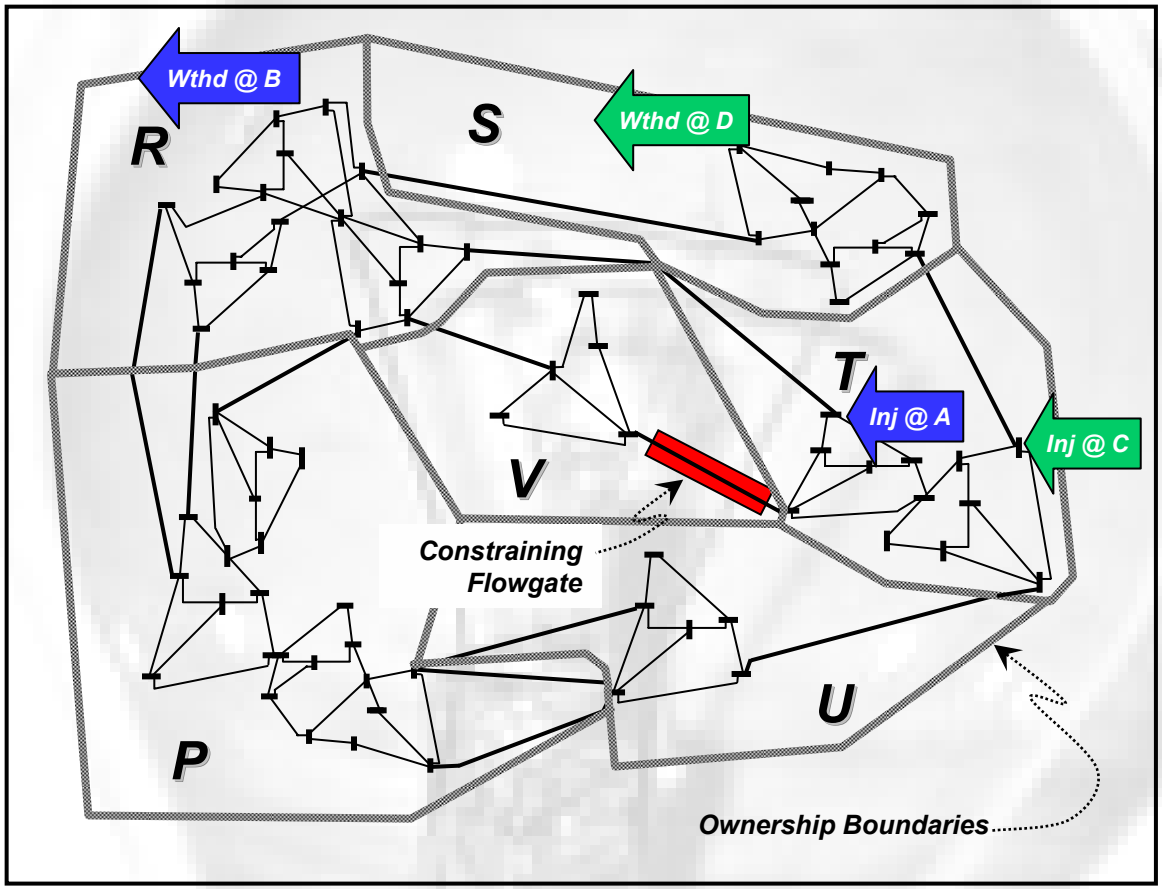
Design Overview
Basics

The reconfiguration design has the following basic characteristics…

- Opportunity for rights holders to sell transmission rights
- Offers made in Annual, Monthly, Intra-month and Daily Auctions
- Pre-existing transmission rights must be certified prior to offering them into the RCS
- IWRs awarded in response to bids to buy
- Value of rights awarded is maximized
- Sellers are paid for rights sold
- RCS does not need a one-to-one match to enable trades of IWRs to occur
- Rights can be created through Capacity Expansion Service

Design Overview
Reconfiguration Enabled

Reconfiguration cannot be done on a bilateral basis. An independent party must operate the auctions and be responsible for managing capacity for the combined system…

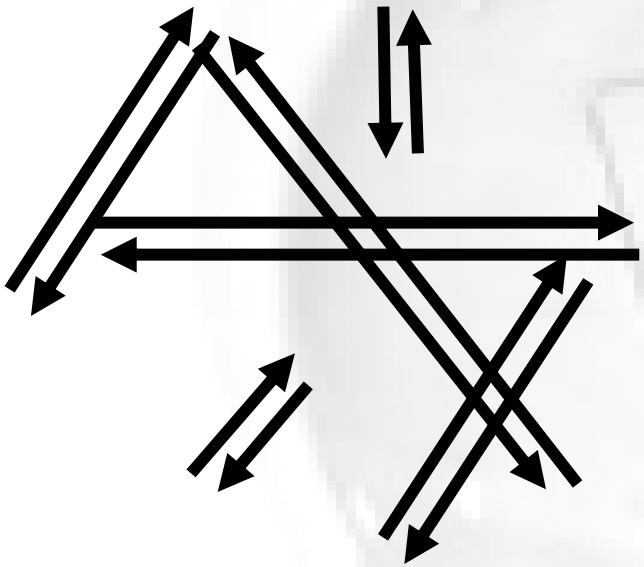


Voluntary CCA Markets

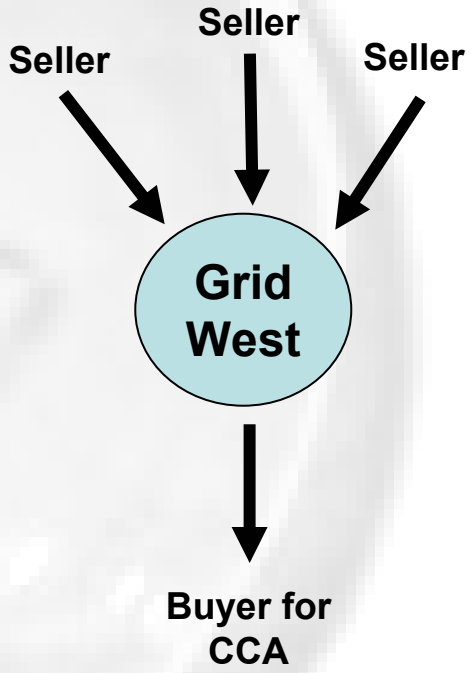
Design Overview
Centralized vs. Bilateral Markets

Grid West will introduce independent and centralized markets for reserves and balancing energy…

Bilateral Approach



Centralized Approach



Design Overview
CCA Reserve Market Basics

The CCA reserve market design has the following basic characteristics…

- Grid West will administer a central day-ahead reserve market
- The purpose is to meet the reserve requirements of the CCA
- Reserves can be provided by eligible resources inside or outside the CCA
- Consolidating parties will be obligated to offer ancillary services at least equal to their own requirement into any reserve market when offers into the day ahead market are not sufficient to meet CCA requirements
- Reserve requirements are determined by Grid West to satisfy the NERC and WECC criteria
- Congestion regions within the CCA will be used where and when required

Design Overview
CCA Balancing Service Basics

The CCA balancing service design has the following basic characteristics…

- Grid West will administer the centralized real-time balancing service (RBS) for the CCA
- Balanced energy schedules are required
- Imbalance requirements are expected to be a small percentage of the total energy demand
- Parties within the CCA may submit Inc offers and/or Dec bids into the RBS
- Parties outside the CCA can also submit Inc offers and/or Dec bids to provide services. These will be considered as long as they serve to meet the requirements of the CCA.

Design Overview
CCA Balancing Service Basics

The CCA balancing service design has the following basic characteristics…

- Transmission rights are not required
- Balancing service will support generation/load following, manage congestion, and promote economic efficiency within the CCA
- Locational pricing will be used
- Dispatch instructions will be routed through the Grid West control system to the control systems of consolidating Transmission Owners (TOs) and participants outside the CCA

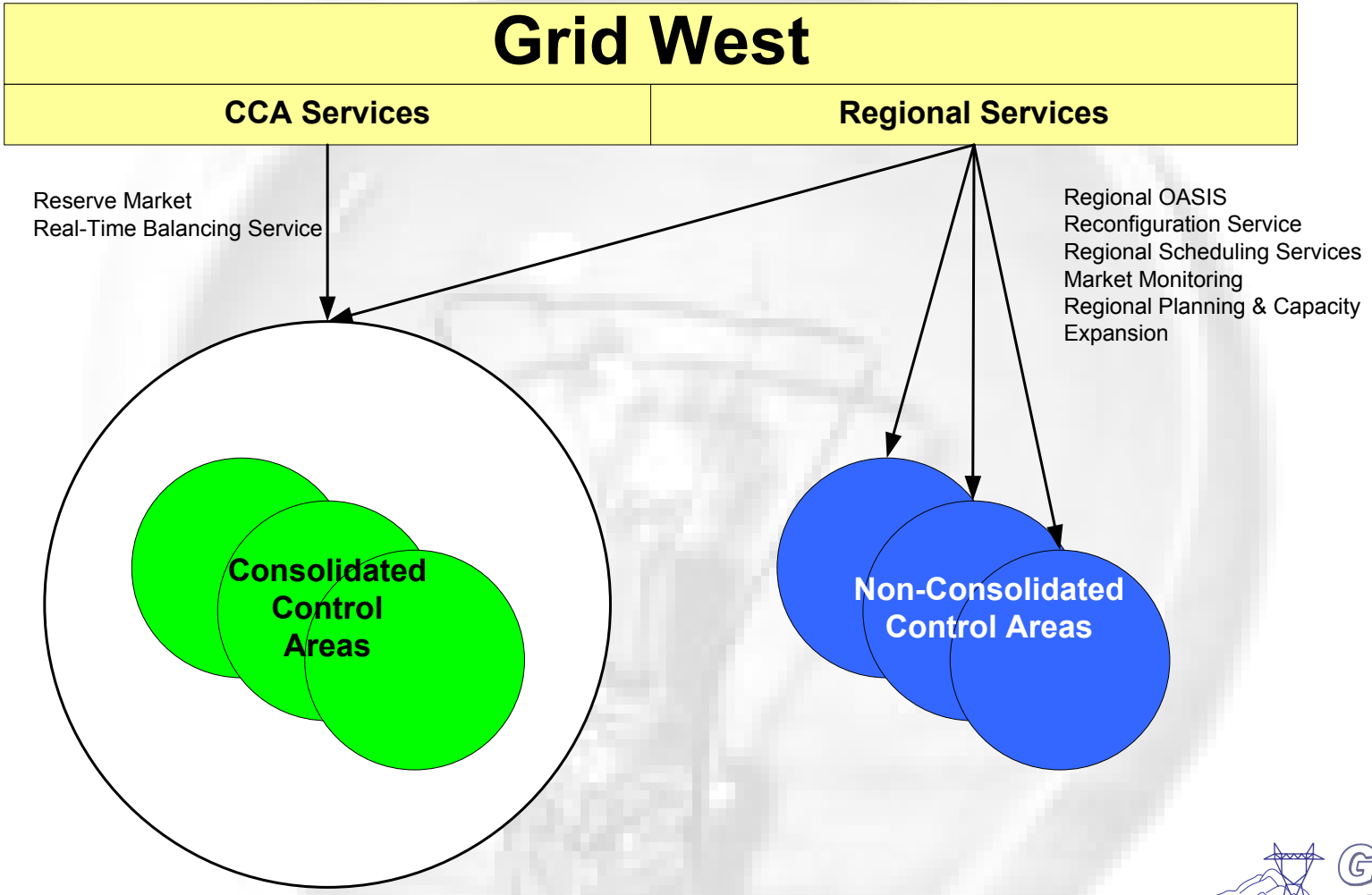
Centralized Planning & Capacity Expansion

Design Overview
Centralized Planning & Capacity Expansion

As a part of Grid West basic features, Grid West will introduce centralized planning and capacity expansion…

- A single queue for transmission service requests
- Clear definition of the long-term, system-wide rights obtained by funding expansion (IWRs)
- Planning with transmission adequacy backstops
  - Mechanism for allocating costs to TOs, if necessary

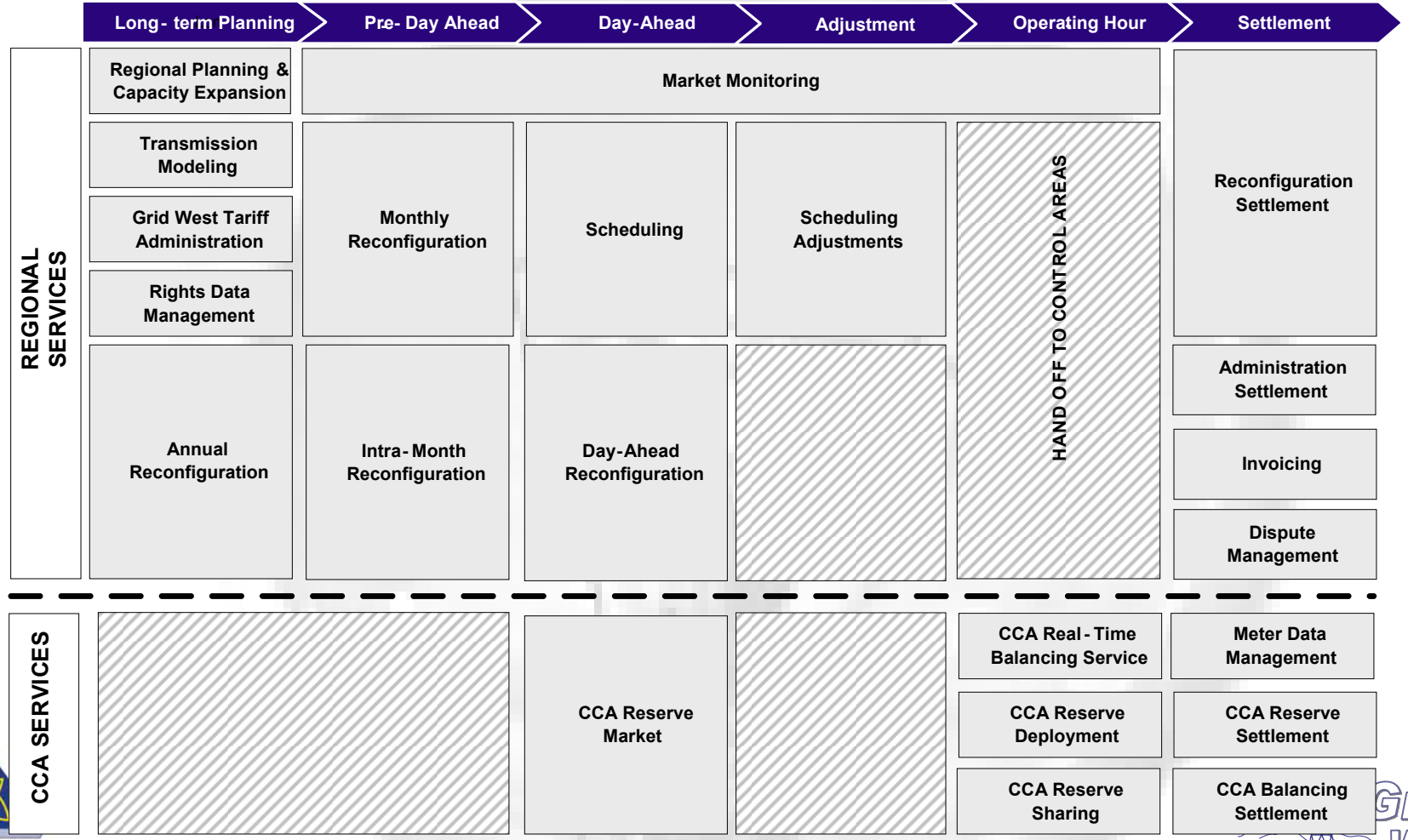
The RRG defined the following services model…



The TSLG has defined the following time-periods…

- **Long-term Planning Period** – The Long-term Planning Period is defined as the time 1-10 years prior to the Operating Day.
- **Pre-Day Ahead Period** – The Pre-Day Ahead Period is defined as the time 2-365 days prior to the Day-Ahead Period.
- **Day-Ahead Period** – The Day-Ahead Period is defined as the time beginning at 5:00 am (or similar time) of the day preceding a given operating day and ending at approximately 5:00 pm of the day prior to a given operating day.
- **Adjustment Period** – The Adjustment Period is defined as the time from the close of the Day-Ahead Period to the time Z minutes prior to the Operating Hour. (where Z will be defined at a later time)
- **Operating Hour** – The Operating Hour is defined as the time beginning Z minutes prior to hour till the completion of the hour. (where Z will be defined at a later time)
- **Settlement Period** – The Settlement Period is defined as the time after the Operating Day.

As a part of Grid West basic features, Grid West will perform the following functions…



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The Day-In-The-Life section will cover the following…

- What are the things customers do today?
- What is Grid West proposing for tomorrow?
- What is changing?
- What remains the same?

Participation in Grid West services is voluntary…

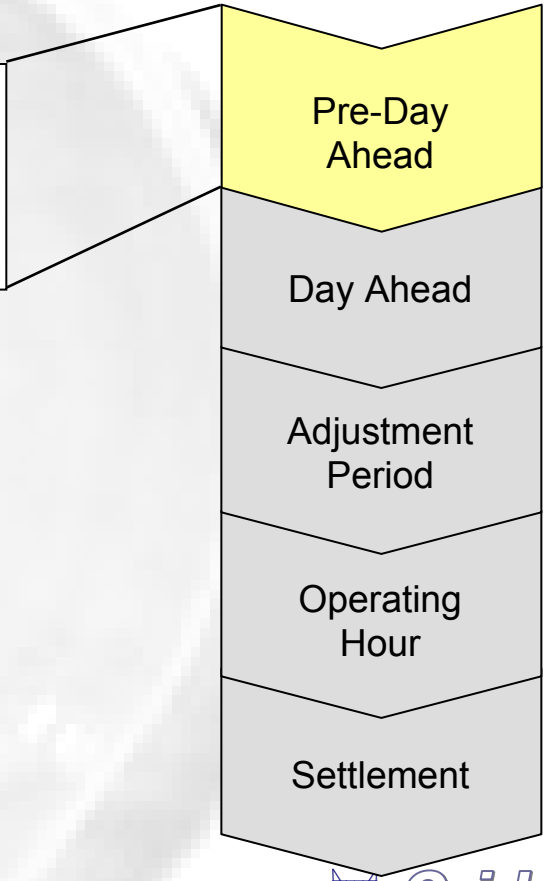
- Customers are not required to certify or translate their existing transmission rights
- Customers can continue to submit schedules to their TO
- Customers are not required to offer their transmission rights into the reconfiguration service (RCS)
- Customers are not required to submit reserves offers
- Customers are not required to submit balancing service offers

The Day-in-the-Life examples have been divided into the following time periods…

- Pre-Day Ahead
- Day-Ahead
- Adjustment Period
- Operating Hour
- Settlement

The following activities occur during the pre-day ahead period…

- Bilateral Energy Trading
- Rights Acquisition



The following changes will occur in the pre-day ahead time period…

Today

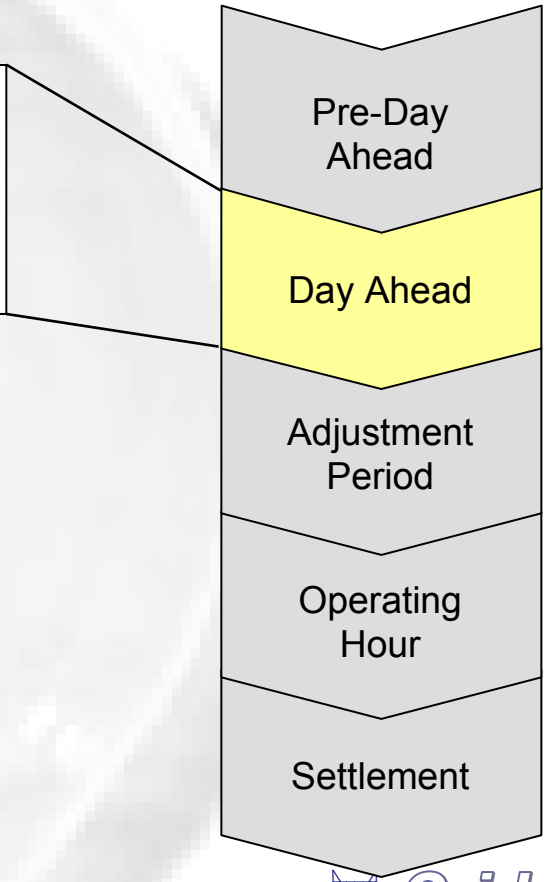
- Customers trade energy bilaterally
- Customers acquire transmission rights from individual providers or by finding a right holder with matching rights who is willing to sell

Tomorrow

- Bilateral trading of energy will continue - **unchanged**
- Customers will now have the ability to buy/sell transmission rights through a centralized rights auction (the reconfiguration service) – **improvement**

The following activities occur during the day-ahead period…

- Bilateral Energy Trading
- Rights Acquisition
- Scheduling
- Reserve Acquisition



The following changes will occur in the day-ahead time period…

Today

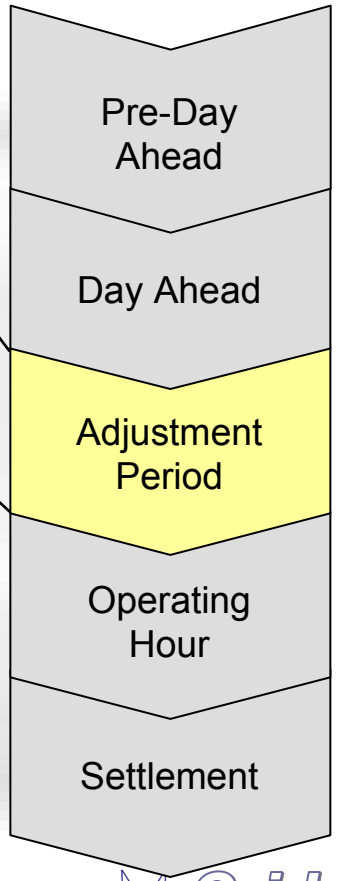
- Customers trade energy bilaterally
- Customers acquire transmission rights from individual providers or by finding a right holder with matching rights who is willing to sell
- Create reservations on multiple OASIS systems
- Submit schedules to multiple TOs
- Acquire reserves bilaterally
- Perform checkout with multiple control areas

Tomorrow

- Bilateral trading of energy will continue - **unchanged**
- Customers will now have the ability to buy/sell transmission rights through a centralized rights auction (the reconfiguration service) - **improvement**
- Grid West will maintain a single OASIS as a part of the Market Information System - **improvement**
- Participants with existing rights continue to submit schedules to TOs; however, Participants with IWRs will schedule directly with Grid West - **new feature**
- Participants outside the CCA can offer reserves into the CCA reserve market - **improvement**
- Grid West will procure reserves for the CCA in an economically efficient manner – **improvement**
- Grid West will manage the checkout process - **improvement**

The following activities occur during the adjustment period…

- Scheduling Adjustments



The following changes will occur in the adjustment time period…

Today

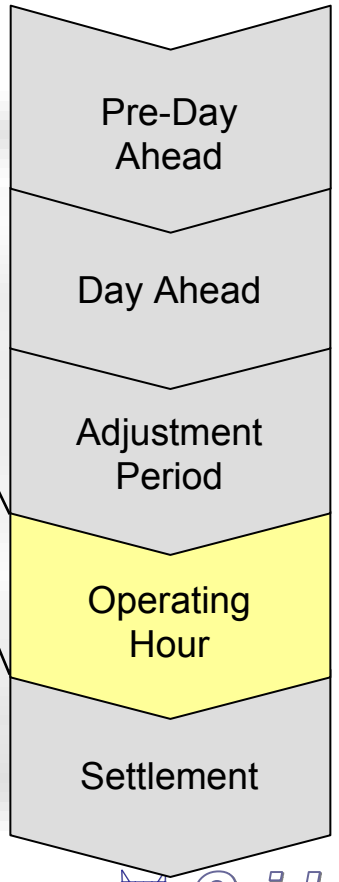
- Customers can change their schedules up to 20m prior to the Operating Hour
- Customers can request new service after the close of the Day-Ahead market
- Most curtailments occur in real-time

Tomorrow

- Customers can still change their schedules up to 20m prior to the Operating Hour - **unchanged**
- Customers can still request new services during the adjustment period on a first-come first-served basis. Instead of working with individual TO's, customers can request service through Grid West - **improvement**
- System-wide view of transmission system should reduce number of curtailments – **improvement**
- Customers can submit Inc offers and/or Dec bids into the CCA balancing service **- improvement**

The following activities occur during the operating hour period…

- Operations
- Dispatch



The following changes will occur in the operating hour period…

Today

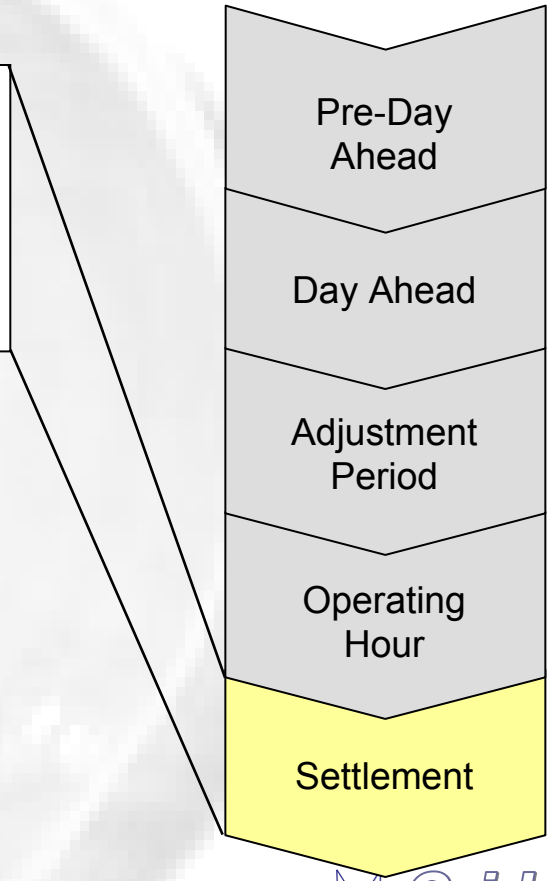
- TOs dispatch generating units directly
- No formal imbalance market exists
- Customers are charged an administrative price for balancing energy

Tomorrow

- TOs will continue to dispatch generating units with Grid West sending dispatch instructions for selected balancing resources - **new feature**
- Within the CCA, Grid West will direct generation of balancing energy based on economic selection from voluntary inc/dec offers - **improvement**
- Customers can submit Inc offers and/or Dec bids into the CCA balancing service **- improvement**
- Within CCA the customers will be charged a market based price for balancing service - **improvement**

The following activities occur during the settlement period…

- Meter Data Management
- Settlement
- Invoicing
- Dispute Management



The following changes will occur in the settlement time period…

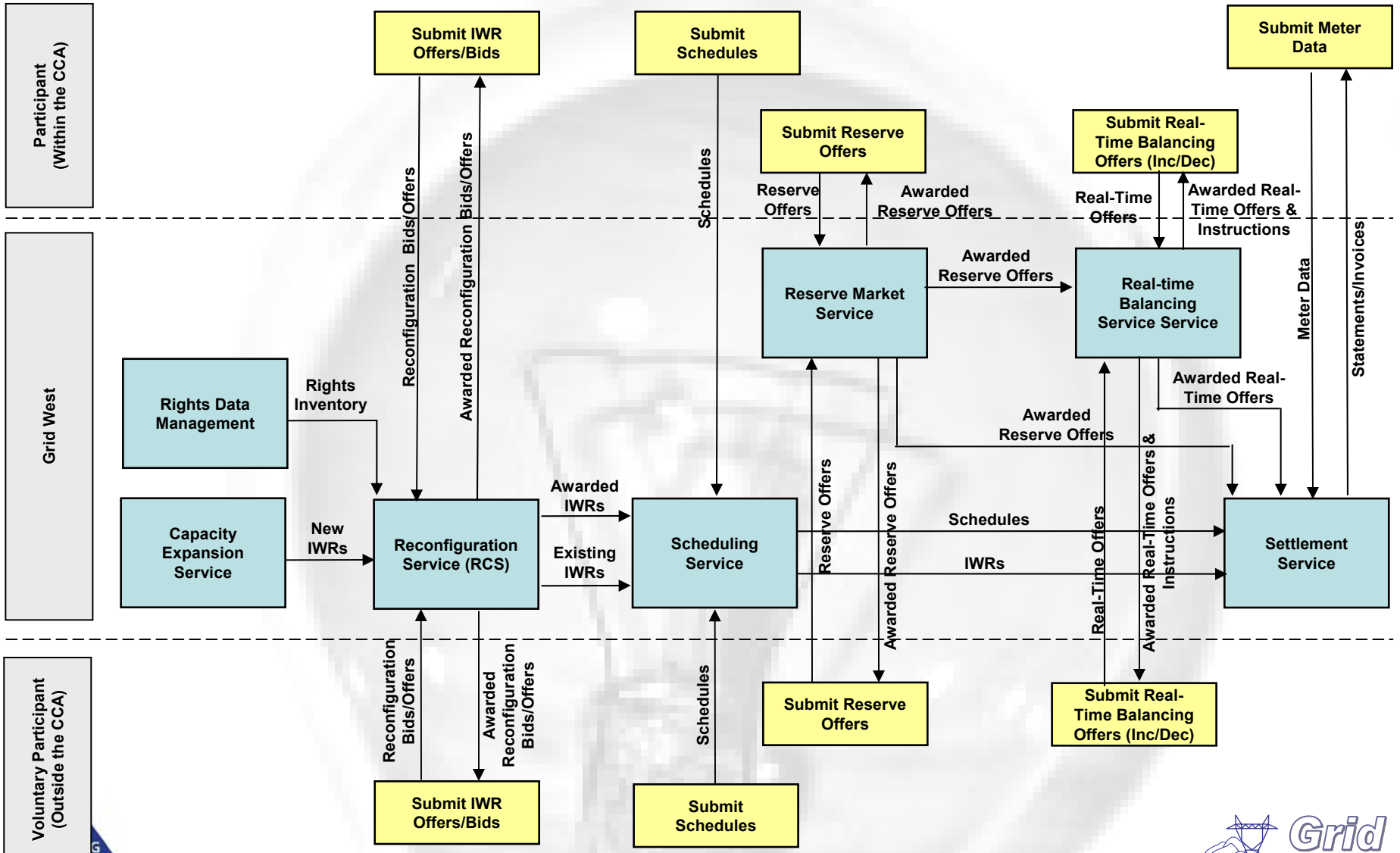
Today

- TOs poll meter data for customers
- Customers receive a bill from their TO for OATT services
- Customers can dispute charges found on their bills

Tomorrow

- Some customers will submit meter data to Grid West directly - **new feature**
- Customers will continue to receive a bill from their TOs; however, some customers will also receive a statement/invoice from Grid West - **new feature**
- Customers will continue to have the opportunity to submit disputes **- unchanged**

Day-in-the-Life
Summary



Outline

- Welcome
- Introduction
- How Did We Get Here?
- TSLG Assignment
- Regional Problems
- Design Overview
- Day-in-the-Life
- Feature Details
- Tying it All Together
- TSLG's Top 8 Issues
- Conclusions
- Question & Answer

The following identified problems will be covered within this section…

- Underutilization of existing transmission capacity
- Operational challenges
- Lack of open and transparent ancillary service markets

Underutilization of Existing Transmission Capacity

Feature Details
Underutilization of Existing Transmission Capacity

Although many parts of the system are fully subscribed on a firm basis, the transmission system is currently underutilized…

Proposed Solution

- Move to a flow-based system of physical transmission rights, i.e., standardized injection-withdrawal rights (IWRs)
- Offer reconfiguration services to enable economically based trade in transmission rights

Questions

- What is flow-based scheduling?
- How will residual capacity be released?
- How will Grid West account for existing rights?
- How can I offer my rights into the reconfiguration service?
- How will the reconfiguration work?

Feature Details
White Paper Cross Reference

White Paper Overview: Grid West Market & Operational Design

White Papers

Module 1 *Transmission Service*	Module 2 *Rights Administration*	Module 3a *Scheduling*	Module 3b *Operations*	Module 4 *Ancillary Services*	Module 3c *Settlement*
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	6 Rights Data Management	10 Transmission Losses	14 Emergency Operations		

Reference Papers

21 Congestion Management

22 Auction Pricing

23 Commercial Model

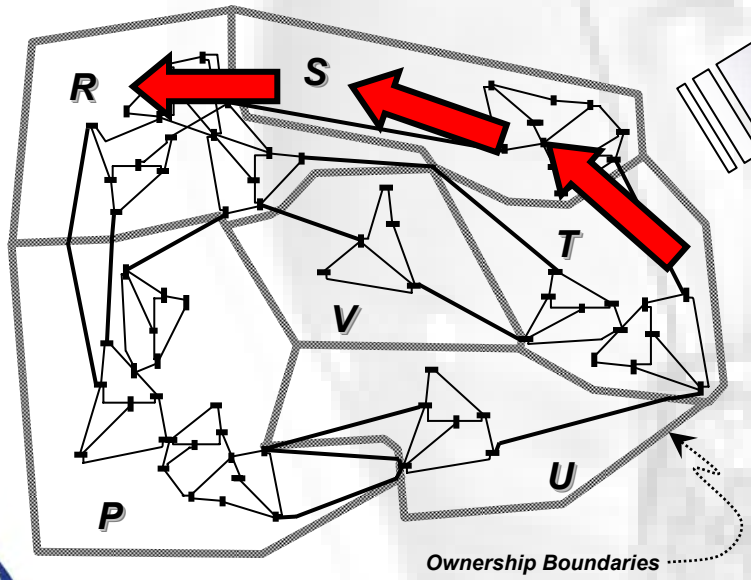
24 Grid West Seams Issues

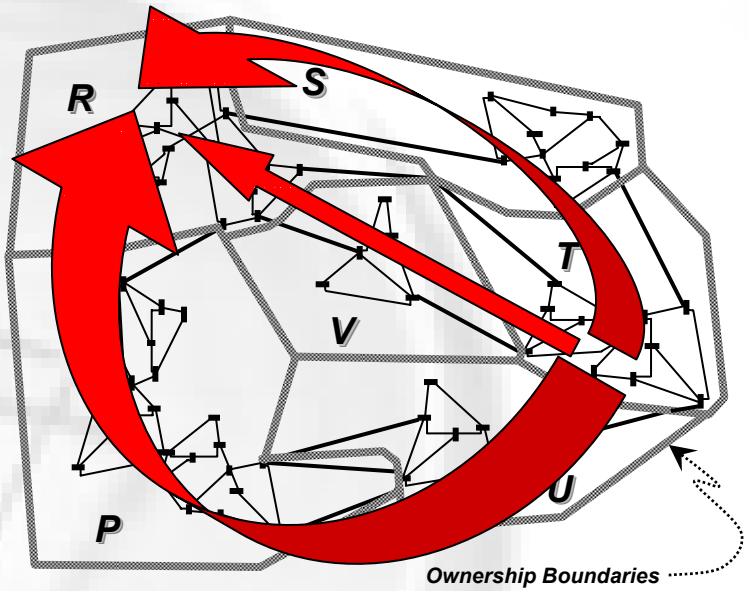
The following concepts are discussed in this section…

- Flow-based scheduling
- Residual capacity
- Rights data management
  - Physical Rights Inventorying
  - Existing Rights Certification
  - IWR Translation Query
  - Bilateral Trade Registration
- Reconfiguration service

The Grid West basic features includes a transition to flow-based scheduling…

Contract Path Past

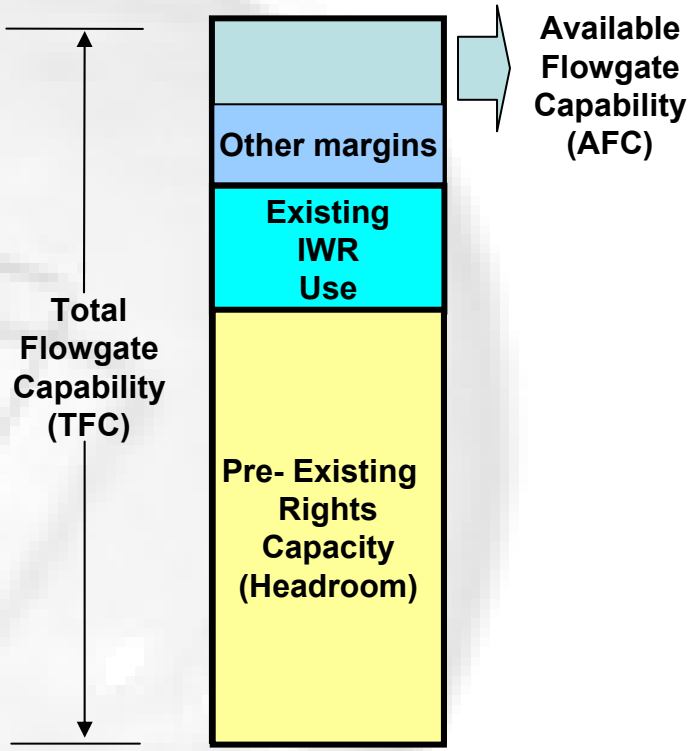




Flow-based Future

The current design reserves adequate headroom for existing rights…

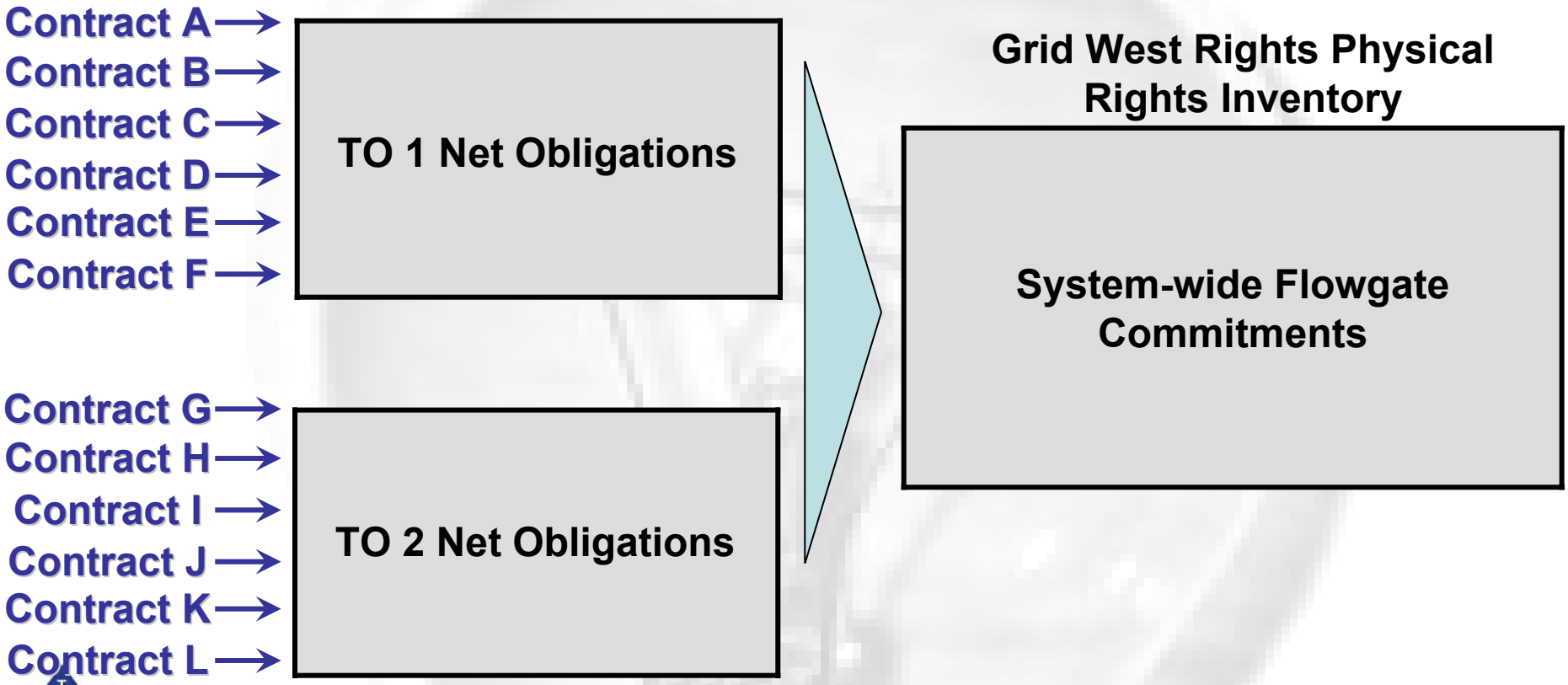
- Available Flowgate Capability, along with offered IWRs, is made available to meet a request by IWRs buyers
- Grid West will have discretion in determining the percentage of the residual capacity to be offered in auction markets
- The payments received for release of residual capacity (i.e., AFC) is used to reduce R3A



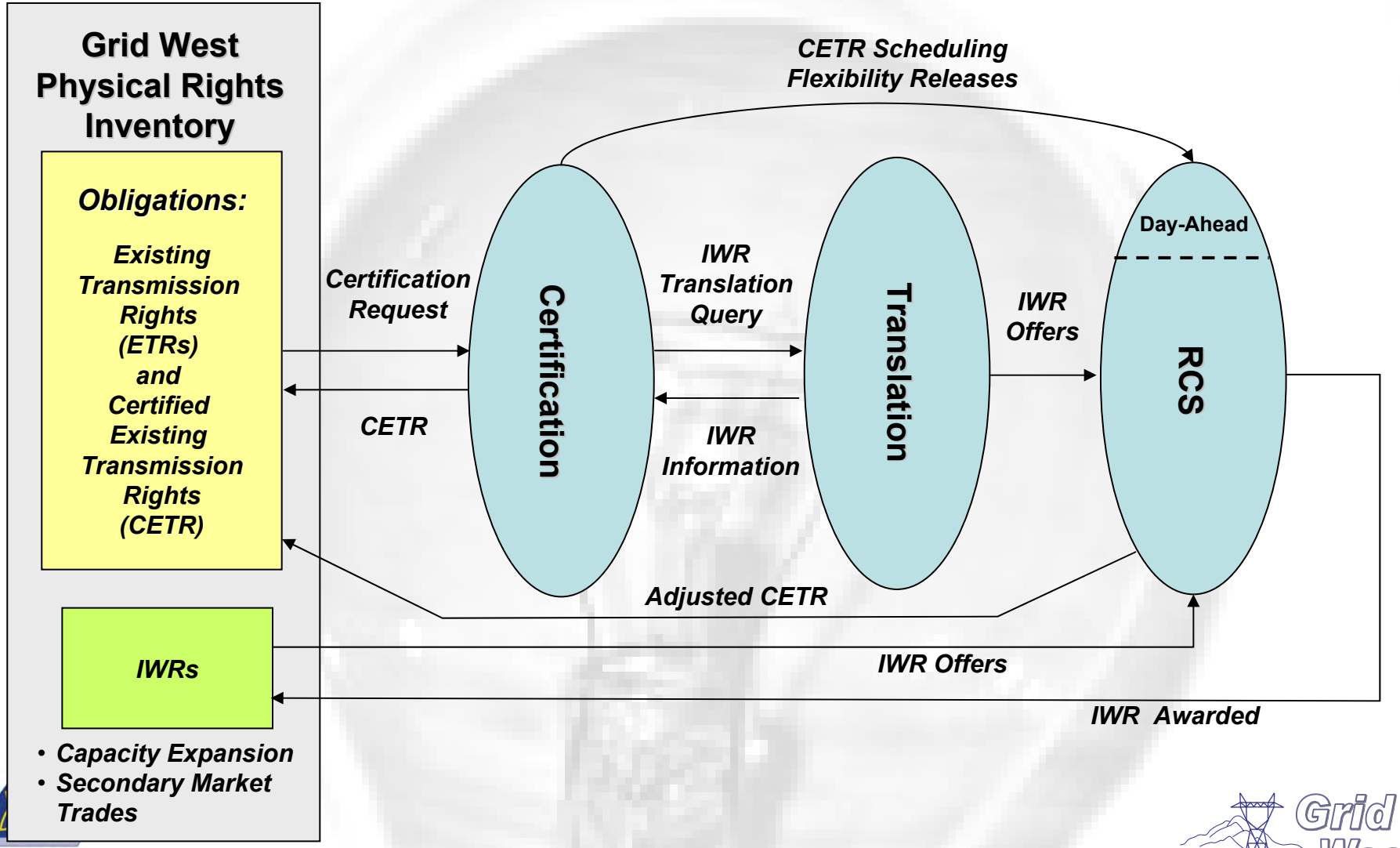
The rights data management function includes the following processes…

- Physical Rights Inventorying
- Existing Transmission Rights Certification
- IWR Translation Query
- Bilateral Trade Registration

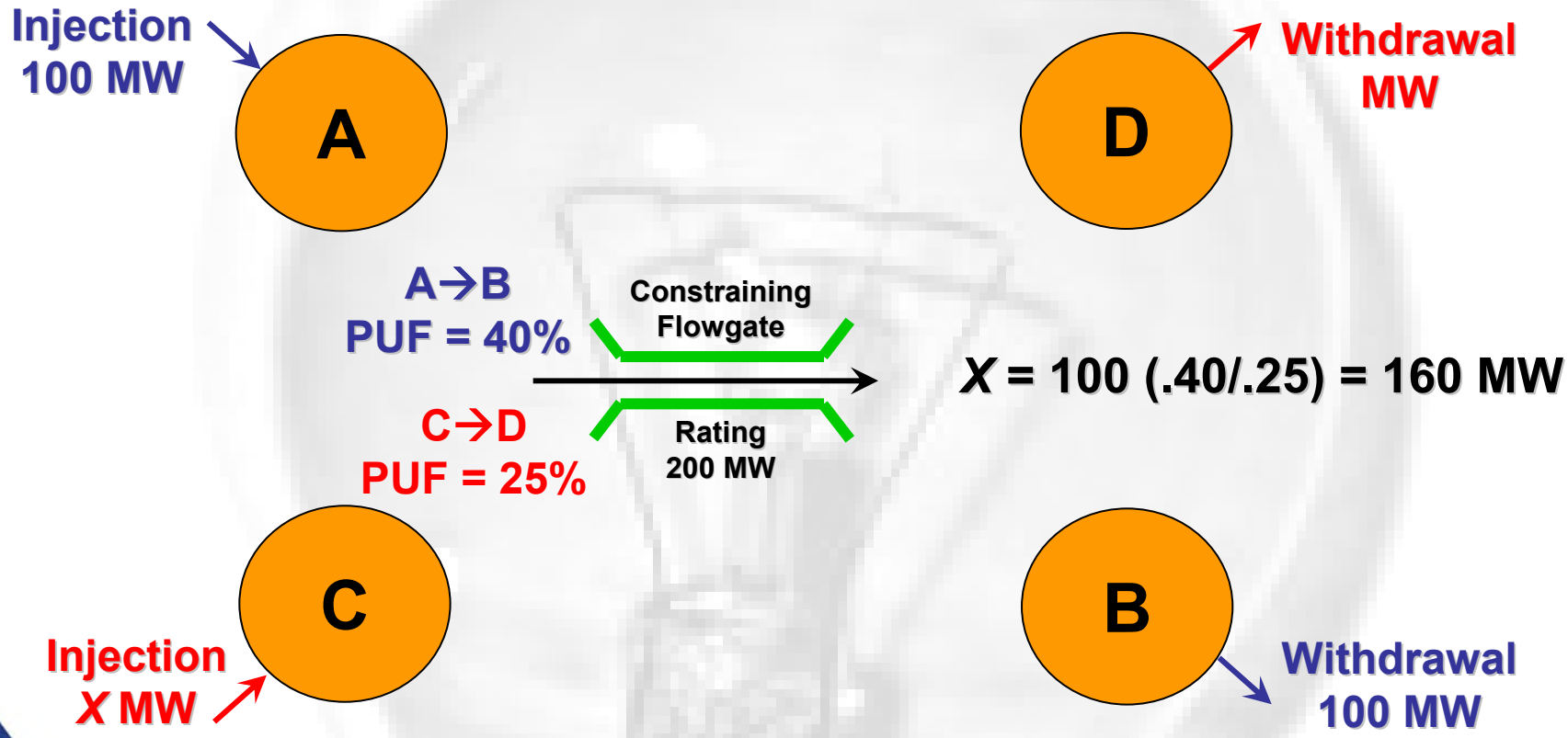
Grid West will inventory each Transmission Owner's existing rights on a net basis…



Feature Details
The RDM Process – End-to-End



If A→B is offered (released) into the Reconfiguration Market, how many IWRs can be made available from C→D?

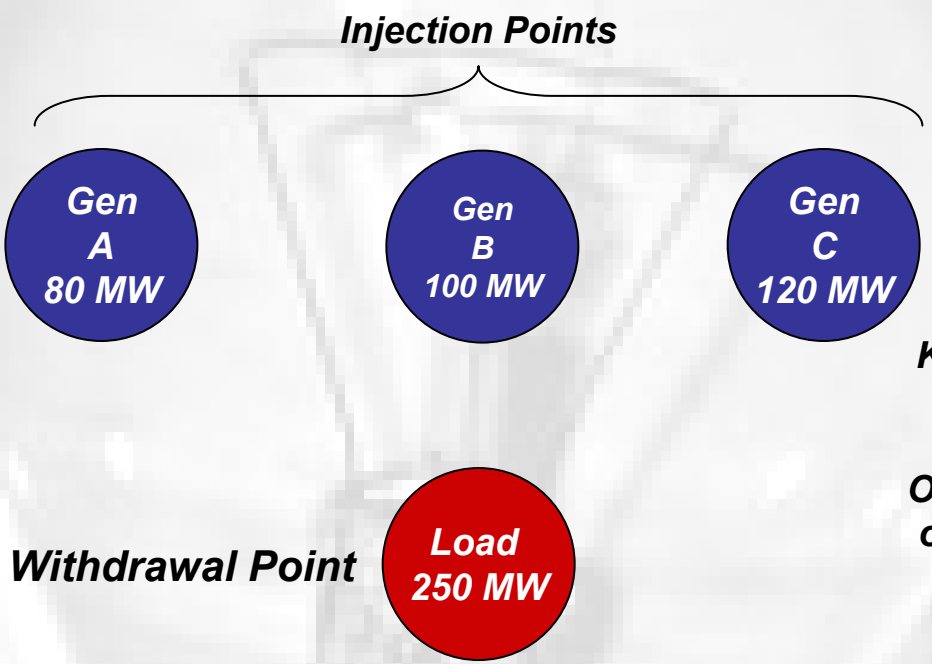


In the Day-Ahead RCS, Transmission Customers who have scheduling flexibility may offer to restrict their use of their flexibility (increasing AFC) and be paid for the value to create…

An Example Situation

Original Flexibility

Sum of Injections 300 MW but total Injections can never exceed load

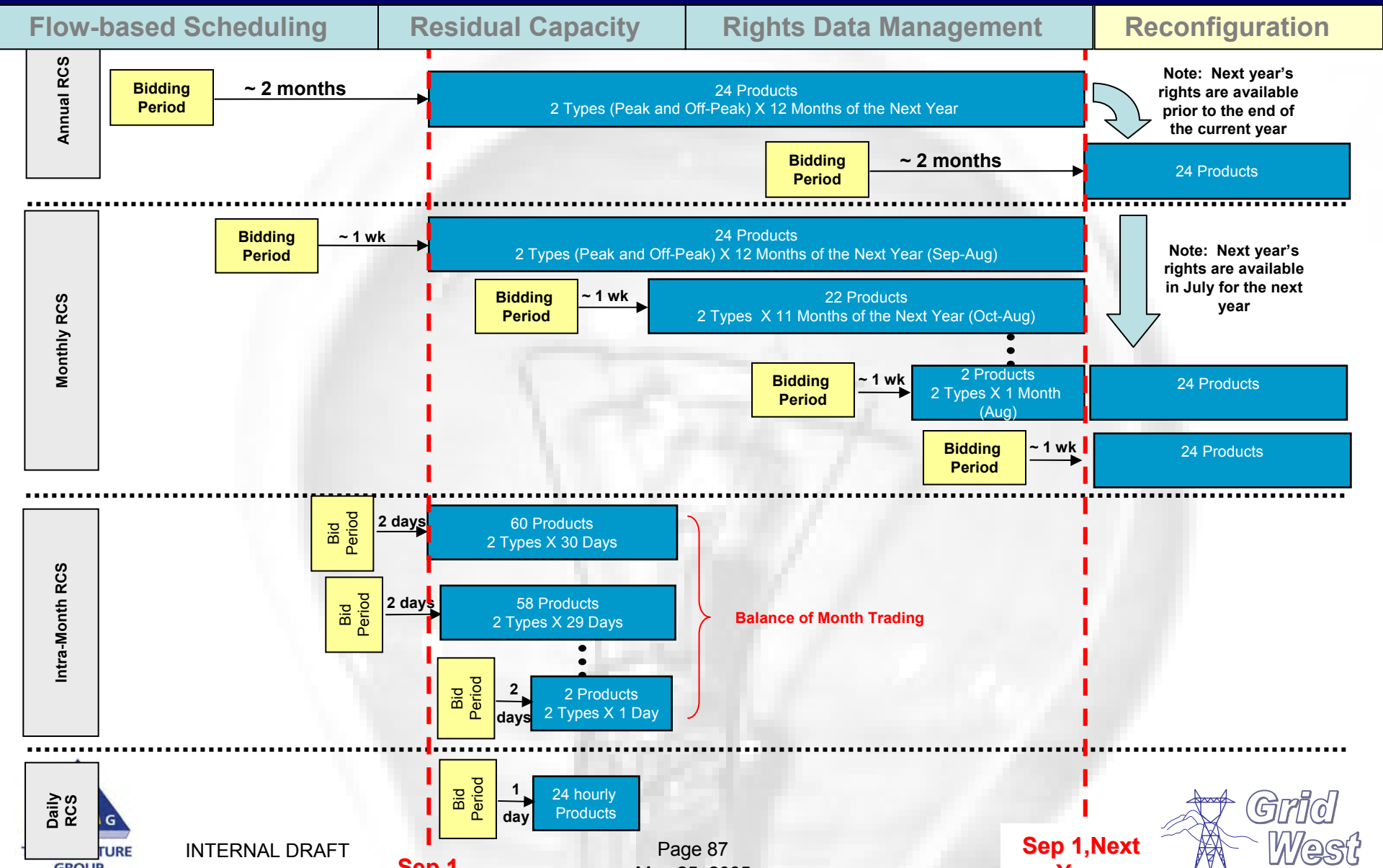


Intended Retained Right

Gen A = 40 MW
Gen B = 100 MW
Gen C = 120 MW
Sum = 260 MW

Kept 10 MW of flexibility to pick-up at Gen A and Offered to give up 40 MW of flexibility to schedule from Gen A

Feature Details
Auction Timeline and Products



Operational Challenges

The proposed solution addresses the identified operational challenges…

Proposed Solution

- Single-system view for issuance of transmission rights and scheduling
- Day-ahead evaluation of system loading when there is time for adjustment

Questions

- How will the scheduling activities be streamlined and how will rights be scheduled?
- How can the CCA obtain the most economical balancing service? What is the scope of the market? Who can participate?
- What loss methodology will be applied to new service? How will existing service be handled?
- What sort of information will Grid West be monitoring?
- Will Grid West issue dispatch instructions to resources or to the TO?

White Paper Overview: Grid West Market & Operational Design

White Papers

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Reference Papers

21 *Congestion Management*

22 *Auction Pricing*

23 *Commercial Model*

24 *Grid West Seams Issues*

THE STRUCTURE GROUP

Grid West

The following concepts are discussed in this section…

- Scheduling Timeline
- Schedule Submission
- Transmission Losses for New Service
- Scope of the Balancing Market
- Source of Balancing Energy
- CCA Dispatch Model

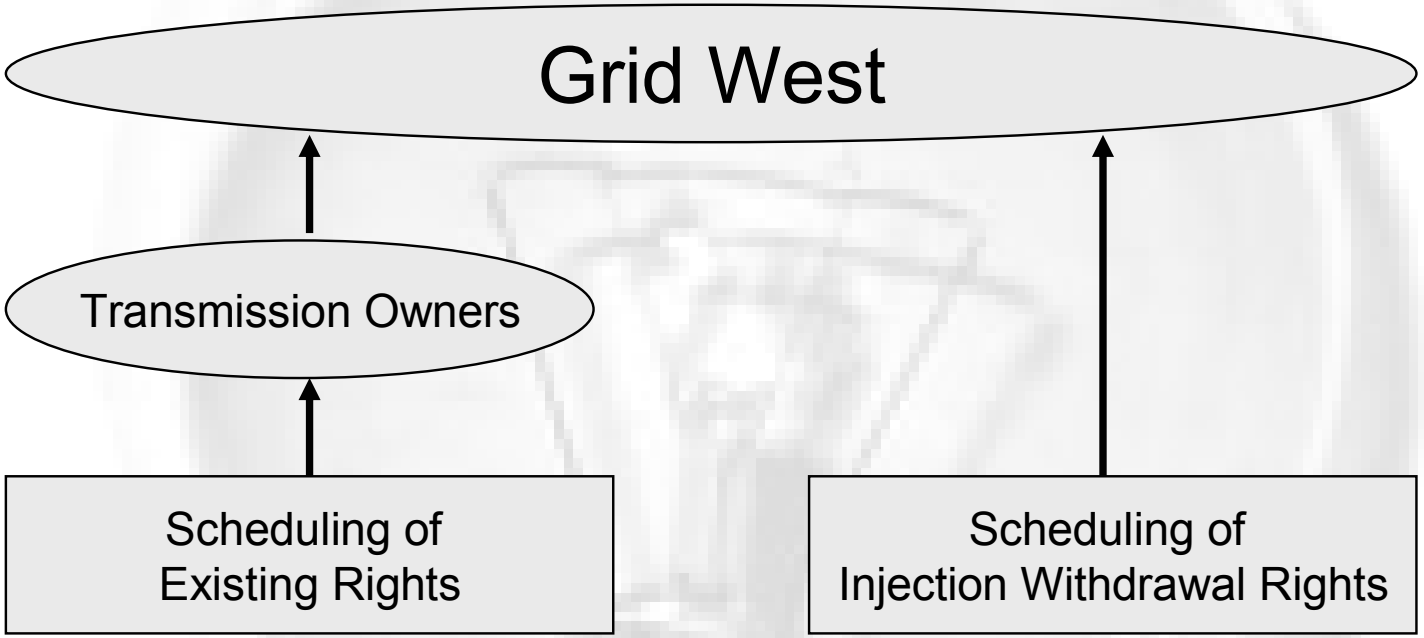
Feature Details
Scheduling Timeline

Time

Grid West	Transmission Customer	Transmission Owner
	•Bilateral trading •Submit bids/offers to RCS	
•Perform D-RCS		
•Update existing rights inventory •Update AFC based on the DA-RCS		
	•Existing Rights Holders submit schedules to TOs	
	•IWR holders submit schedules to Grid West	•Submit aggregated schedules to Grid West
•Validate schedules against inventory •If feasible, Grid West will accept the schedules and publish final schedule •If infeasible, Grid West will perform curtailment		
•Post curtailment notices and publish final schedules		
	•Obtain final schedule •Create E-tags	•Obtain final schedule
•Tag Approval		
•Day-ahead checkout		
•Evaluate, accept or deny schedules ("first-come, first-served") using PUF and AFC	•Submit schedule change or new request	•Submit schedule change or new request

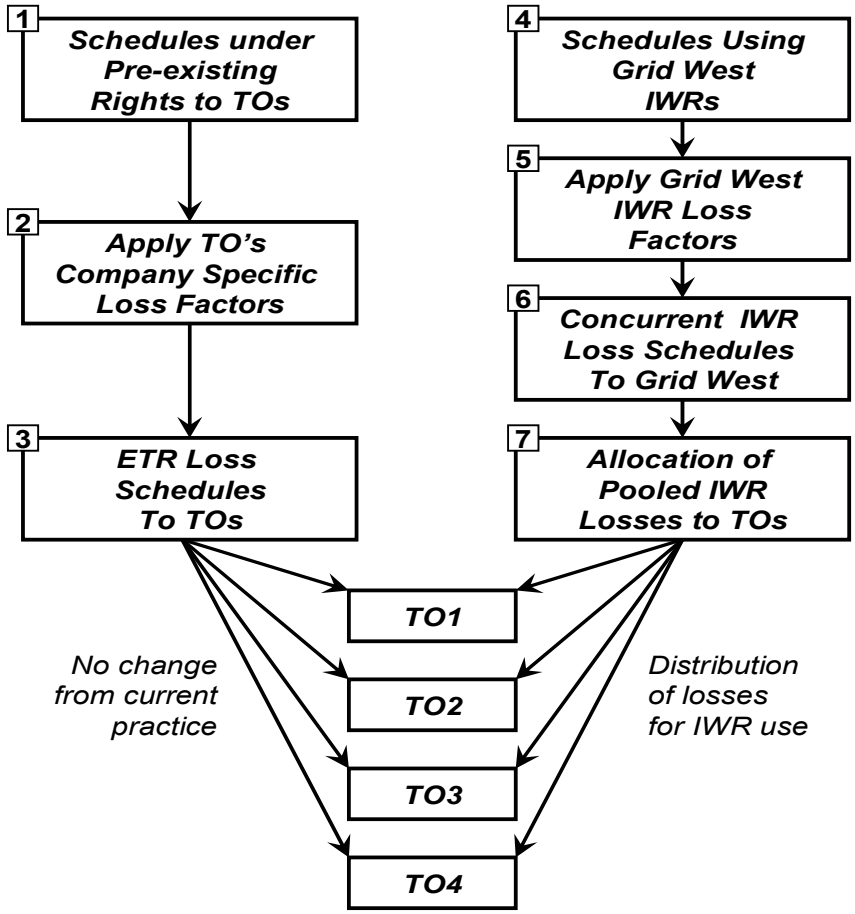
THE STRUCTURE GROUP

Existing rights will be scheduled through the Transmission Owners while IWRs will be scheduled directly with Grid West…



Feature Details
Transmission Losses

The proposed transmission loss methodology applies to new service only…



Grid West will take the lead in coordinating transmission outages…

- Proposed coordination methodology is based on the existing NWPP process
- Set of notification, comment, review and approval processes are needed
- Grid West will propose alternatives if conflicts exist
- Grid West authority over transmission outages will be defined within Transmission Agreements
- Generation outage information will be requested from facility owners for reliability evaluations
- Generation outage information will not be published

Grid West will perform several of the roles defined within the NERC Reliability Functional Model for <u>both</u> the Consolidated Control Area (CCA) and for the Grid West Managed Transmission System (GWMT), including…

- Reliability functions
- System operation functions
- Market operations functions

In summary, Grid West will perform the following NERC functional responsibilities for the CCA and the GWMT…

Function	CCA	GWMT
Transmission Authority		☑
Balancing Authority	☑	
Interchange Coordinator	☑	
Transmission Service Provider		☑
Interconnection Planning Coordinator		☑
Market Operator	☑	

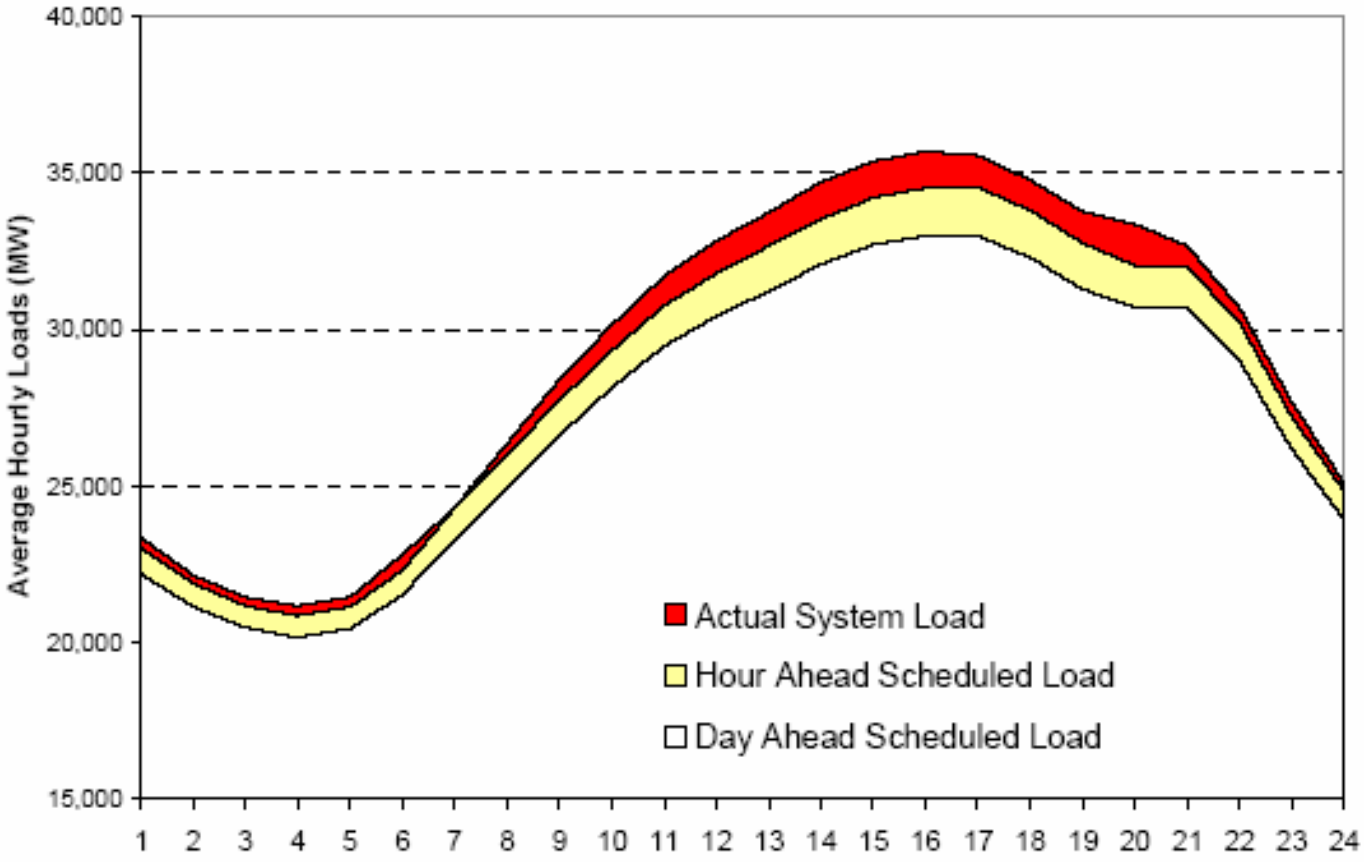
To perform these roles, Grid West must have the ability to monitor, analyze and process relevant system conditions and data in real-time. Examples include…

- Area control error
- System frequency
- Total system load & generation
- Actual interchange
- Thermal facility measurements
- Generation facility measurements

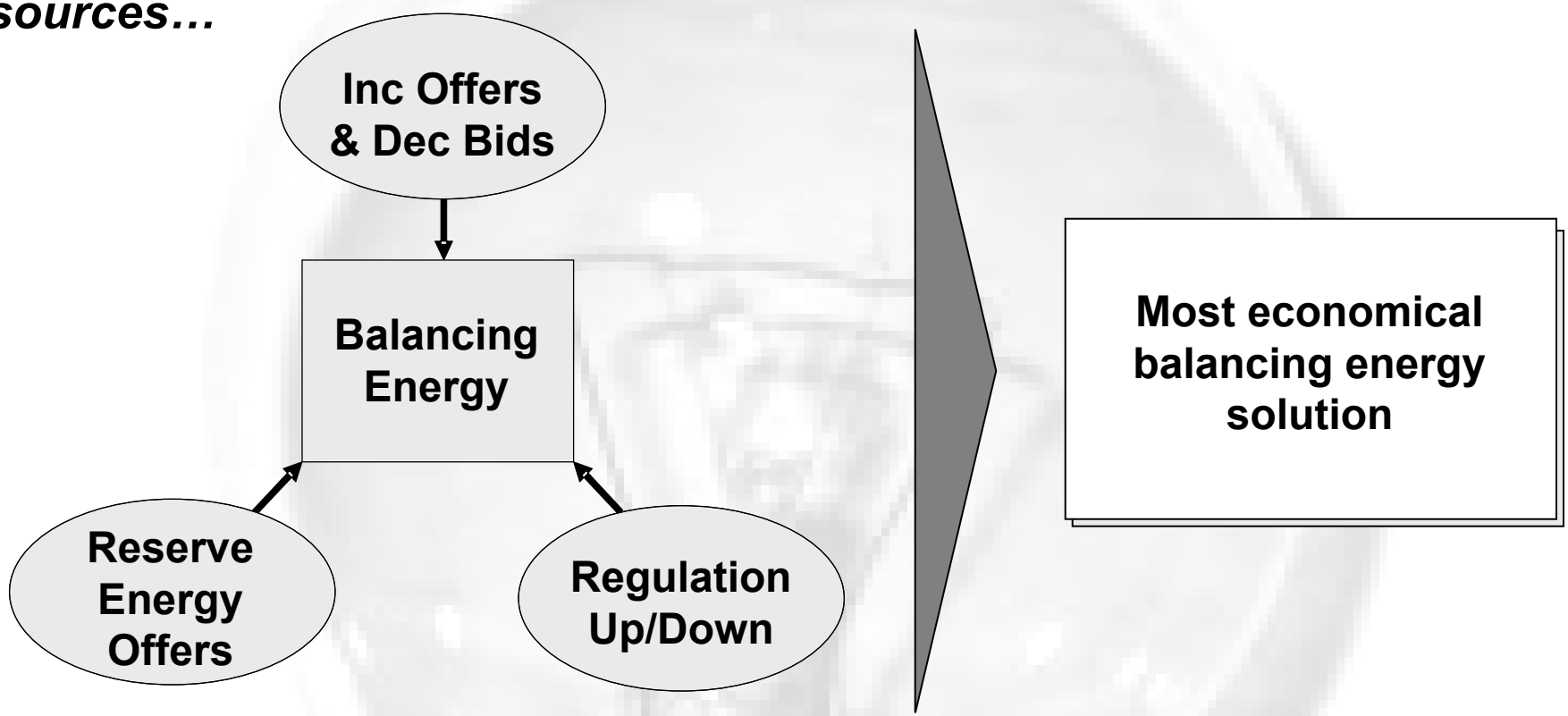
The following summarizes the balancing service…

- Balanced energy schedules are required
- Imbalance requirements are expected to be small
- Parties within the CCA may submit Inc offers and/or Dec bids
- Bids/offers from outside the CCA will be considered as long as they serve to meet the requirements of the CCA
- Transmission rights are not a prerequisite to participation in RBS
- Balancing service will support generation/load following, manage congestion, and promote economic efficiency within the CCA
- Locational pricing will be used

CCA imbalance requirements are expected to be a small percentage of the total energy demand…

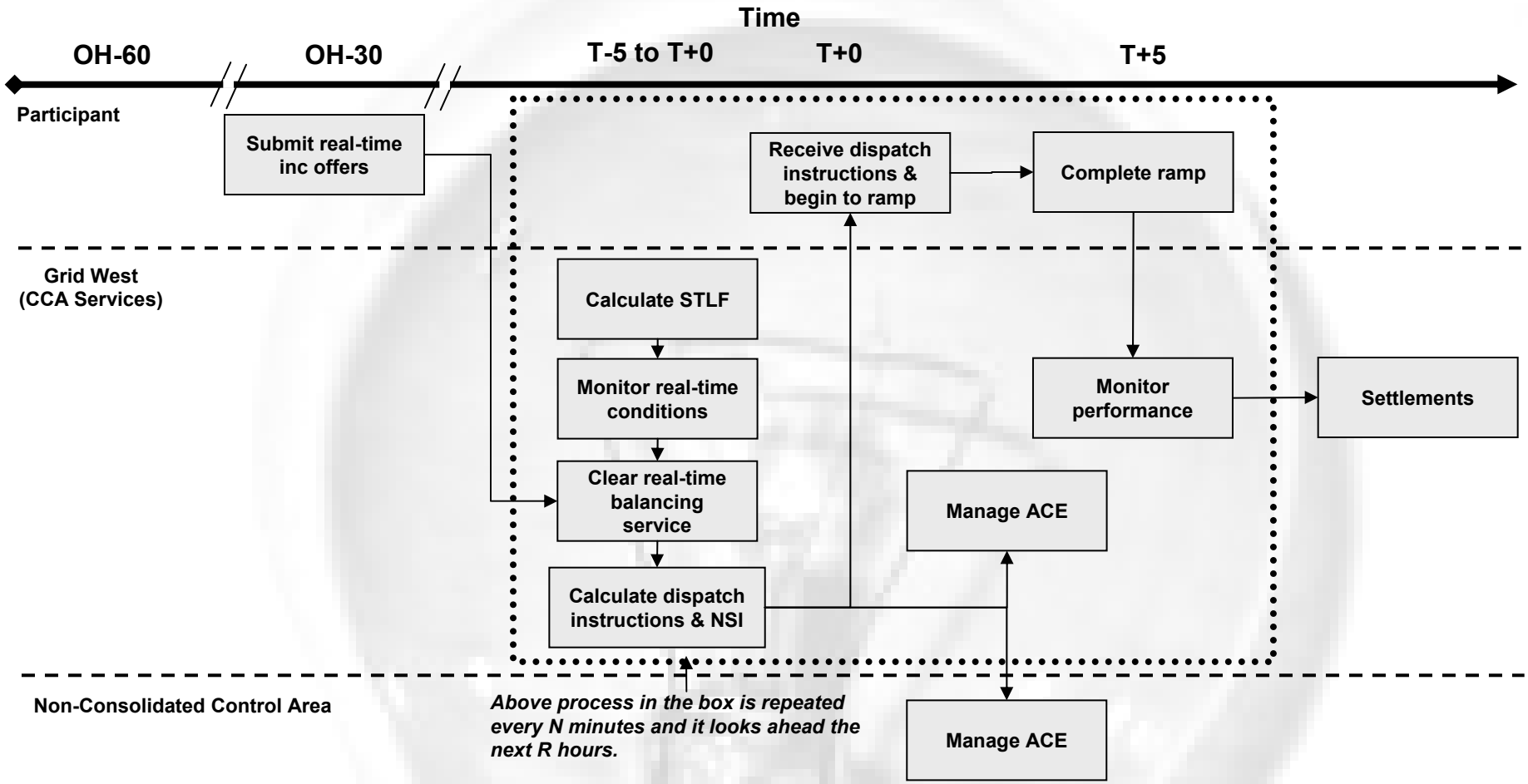


The balancing service will obtain balancing energy from the following sources…



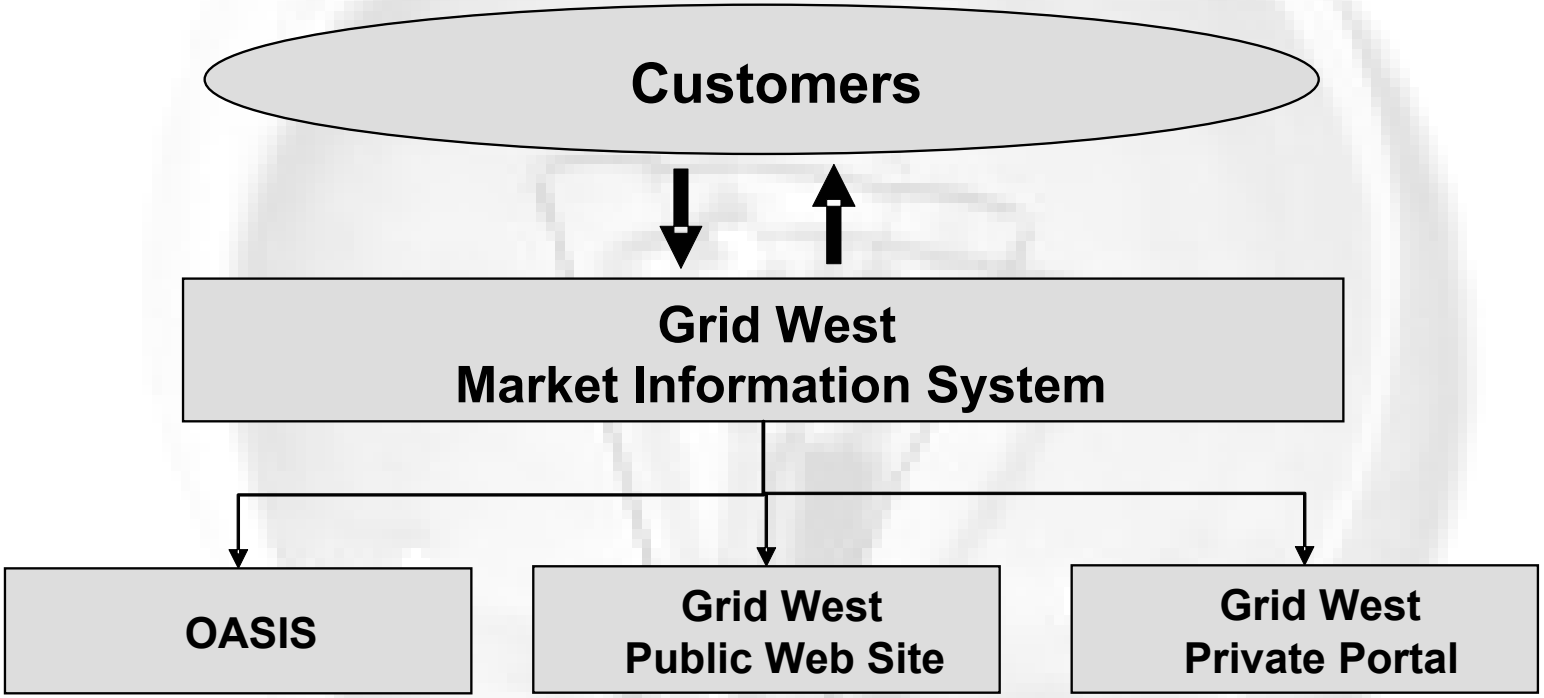
Customers have the ability to flag offers as "reliability only"…

Feature Details
Balancing Service Timeline

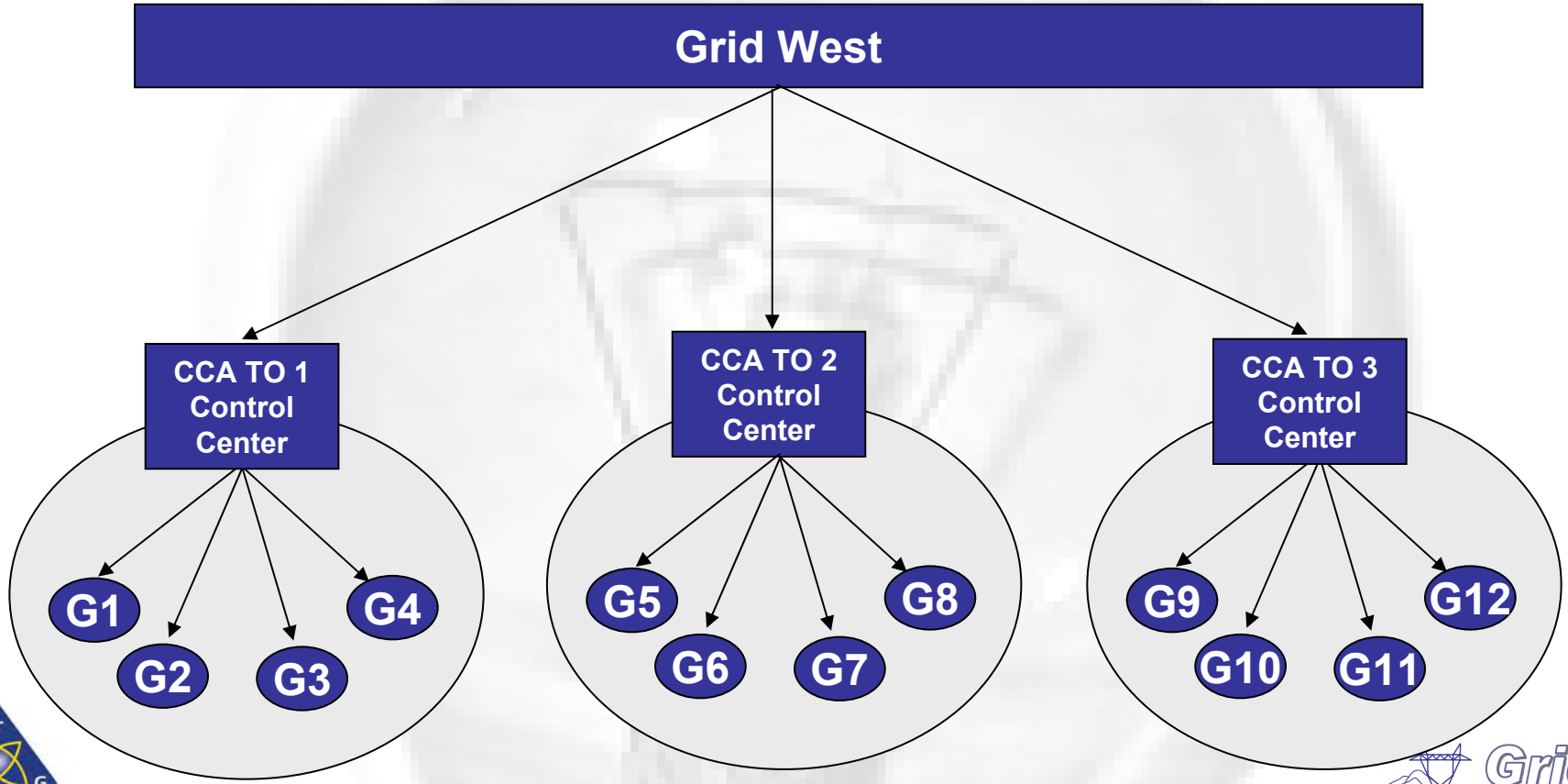


Notes: *1. Times shown are illustrative only to provide context*
2. The exact timing of events (OH-30, etc.) needs to be further defined

Grid West will operate a market information system (MIS) to provide a medium for customers to submit and retrieve transmission and market information…



Initially, Grid West will not dispatch units within the CCA directly. Dispatch instructions will be routed through the existing TO Control Centers…



Open and Transparent Ancillary Service Markets

The proposed solution addresses the need for open and transparent ancillary service markets…

Proposed Solution

- Voluntary consolidation of control areas
- CCA reserve market and a real-time balancing service

Questions?

- What is the scope of the reserve market?
- How can it potentially lower procurement costs?
- How will reserves be deployed?
- Will Grid West continue to participate in the reserve sharing program?

Feature Details
White Paper Cross Reference

White Paper Overview: Grid West Market & Operational Design

White Papers

Module 1 *Transmission Service*	Module 2 *Rights Administration*	Module 3a *Scheduling*	Module 3b *Operations*	Module 4 *Ancillary Services*	Module 3c *Settlement*
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Reference Papers

21 *Congestion Management*

22 *Auction Pricing*

23 *Commercial Model*

24 *Grid West Seams Issues*

THE STRUCTURE GROUP

Grid West

The following concepts are discussed in this section…

- Reserve Products
- Scope of Reserve Market
- Congestion Regions
- Reserve Requirement
- Reserve Obligation
- Deployment of Reserves
- Changes to Reserve Sharing

Ancillary Services are necessary to support reliable operation of the transmission system. Some services will be procured through the CCA reserve market, including:

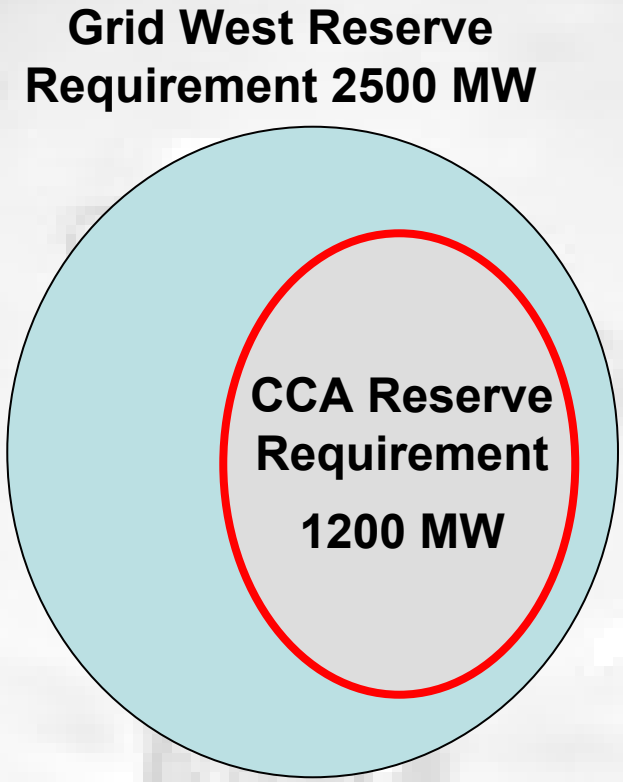
- Regulation Up Service
- Regulation Down Service

Regulating Reserves

- Spinning Reserve Service
- Non-Spinning Reserve Service

Contingency Reserves

The objective of the reserve market is to acquire sufficient operating reserves for the consolidated control area…



When the system is congested, reserves will be locational…

- Grid West will procure the required reserve products for each congestion region as necessary
- For each of the reserve products, Grid West will evaluate the anticipated congestion within the CCA system using the day-ahead proposed schedules and the historical patterns of transmission use to determine if the product will be acquired on a CCA-wide basis or on a smaller congestion region basis
- Grid West will recognize congestion regions while operating reserve markets whenever there is actual or potential internal congestion within the CCA
- Grid West will make available the congestion region information to Grid West customers. Since costs for reserve services in constrained areas may be higher, charges to LSEs may vary by the location of load served

Grid West will calculate the total reserve requirements for the CCA…

Reserve Product	Total Requirements
Regulating reserve	•A percentage of scheduled or forecasted demand.
Contingency reserve – spinning	•A minimum of 50 percent of the contingency reserve requirement, where the requirement is the higher of: - 5 percent of load responsibility carried by hydro and/or wind generation and - 7 percent of load responsibility carried by thermal and other generation, **or** - MSSC (most severe single contingency) in the system
Contingency reserve – non-spinning	•The balance of the contingency reserve requirement not covered by spinning reserve, plus interruptible imports and on-demand obligations.

Grid West and the Transmission Customers to determine responsibility for reserves based on the schedule types that a Transmission Customer is transacting…

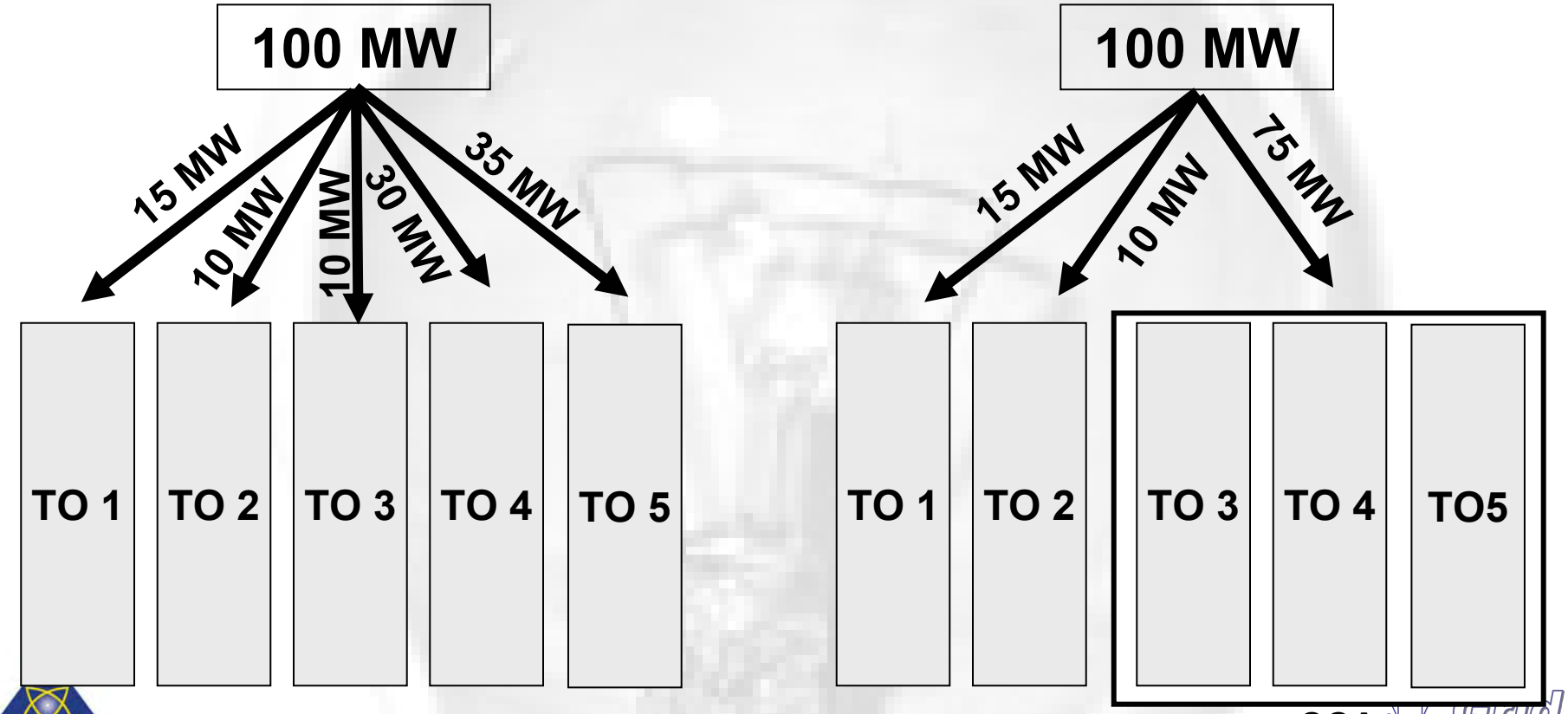
Schedule	Injection Point Location	Withdrawal Point Location	CCA Reserve Obligation
Internal	CCA	CCA	Yes
Export firm	CCA	Outside CCA	Yes
Import firm	Outside CCA	CCA	No
Non-CCA	Outside CCA	Outside CCA	No
Wheeling	Outside GWMT	Outside GWMT	No

If offers are not sufficient to meet the reserve requirement, Grid West will request additional offers from the obligated Transmission Customers…

Grid West will deploy reserves when contingencies occur within the CCA…

- Grid West will deploy regulating reserve to meet NERC Control Performance Standards
- Grid West will dispatch balancing resources so regulation resources can maintain the required regulation capacity
- During contingencies or activation of the NWPP Pro Rata Reserve Sharing (PRRS) program, Grid West will deploy contingency reserves as necessary to maintain system reliability
- During normal operations, Grid West may use excess contingency reserves (spinning and non-spinning) as a source of imbalance energy if the reserve providers have agreed on such and if Grid West can maintain sufficient reserves to ensure reliability

Grid West will continue to participate in the reserve sharing program…



Behind The Scenes

To make all these components works together, the following solution has been proposed…

Proposed Solution

- Grid West will collect meter data to settle the balancing service
- Grid West will perform settlement for both regional and CCA services
- Grid West will manage the dispute process

Questions?

- What type of meter data is required for settlements? Are new meters required?
- Who is responsible for submitting meter data?
- Will new meters be required?
- How often will Grid West run settlements? When will the payment process be triggered?
- What process will I follow to submit a dispute?

Feature Details
White Paper Cross Reference

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21 *Congestion Management*

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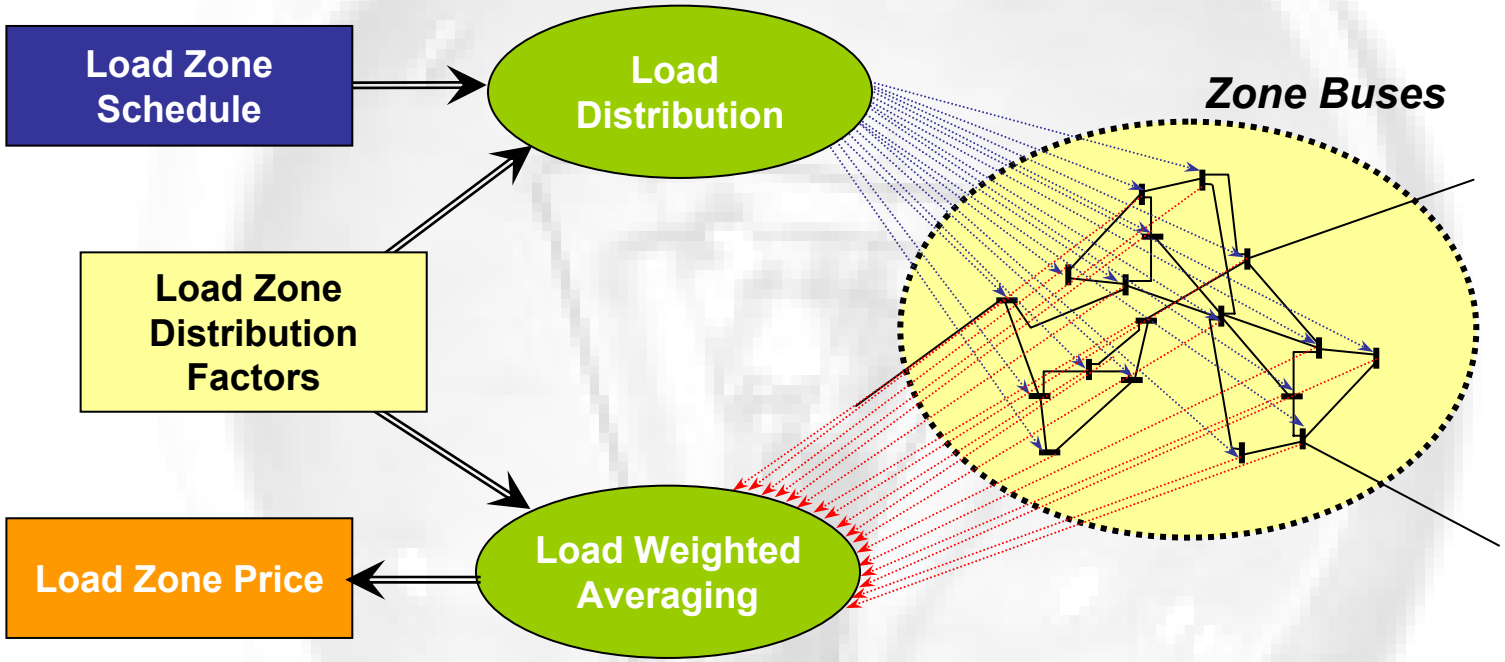
THE STRUCTURE GROUP

Grid West

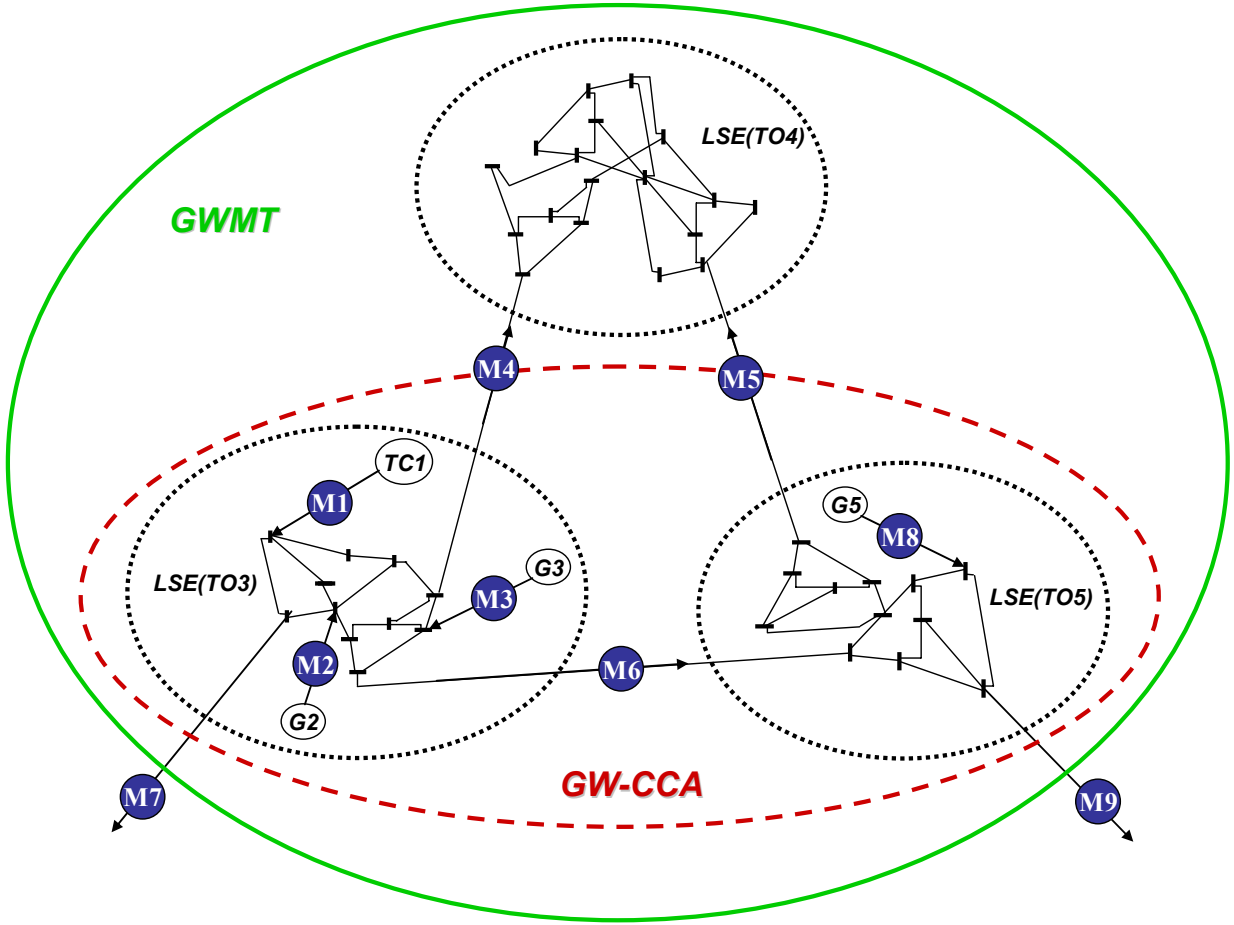
The following concepts are discussed in this section…

- Load Zones
- Settlement Metering
- Drivers of the Settlement Timeline
- Statements vs. Invoices
- Dispute Process

CCA loads will be settled on using a load zone price…

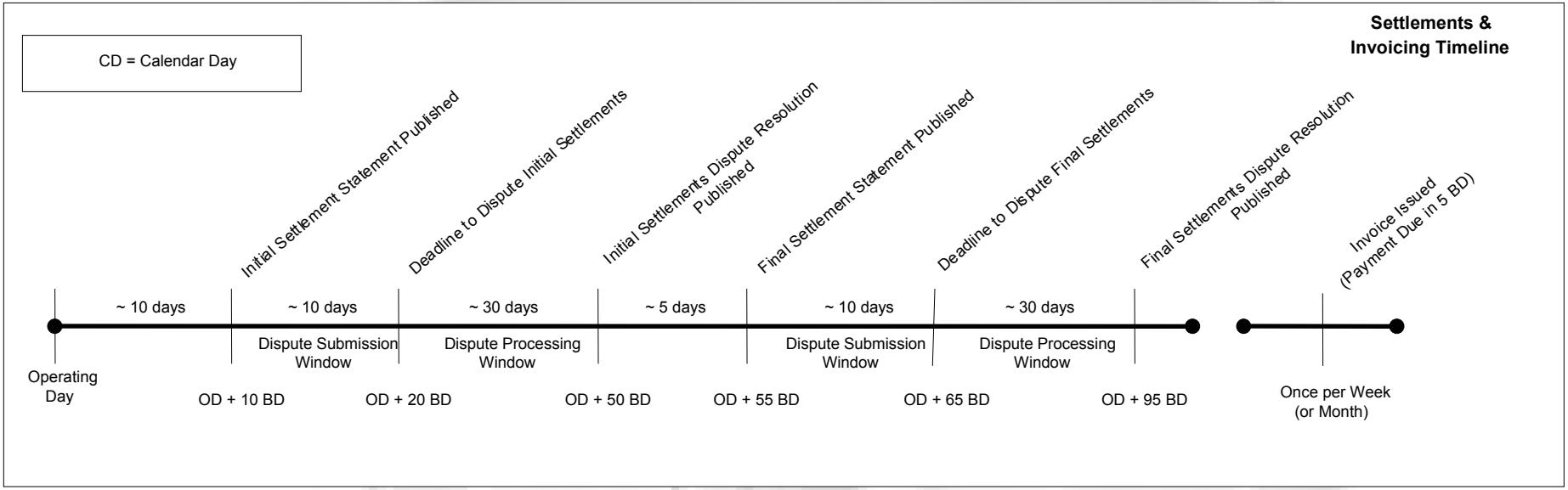


Meter data is required in order to settle the real-time balancing service…



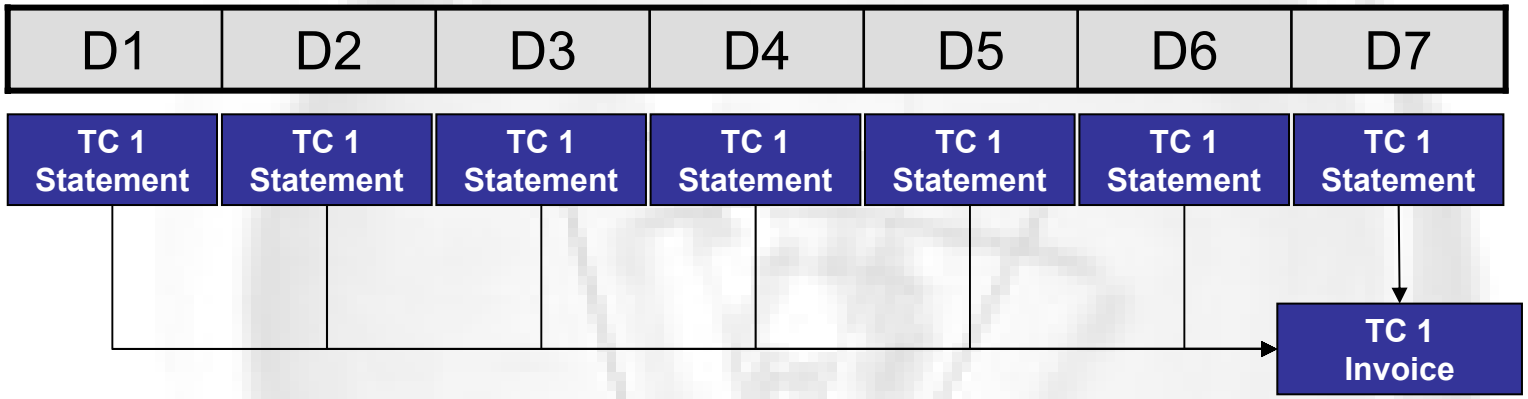
Feature Details
Settlements Timeline

The settlement timeline is driven by credit risk, meter data availability, and the length of the dispute window…



-- dates are illustrative --

A settlement statement will be generated for every operating day. Every 7 (or 30) days, an invoice will be generated…



Invoices trigger the payment process…

Grid West will manage the dispute resolution process…

- Disputes are submitted to Grid West through the Market Information System
- Disputes are submitted within 10 days of the statement/invoice date
- Grid West evaluates disputes within seven days of receipt
- Grid West posts a resolution within 30 days of receipt
- Transmission Customers may move the dispute into ADR at the conclusion of the Grid West dispute process
- A neutral third party will manage the ADR process for billing, certification, and translation disputes
- ADR decisions involving billing, certification and translation disputes should be made within 90 days of receipt

-- dates are illustrative --

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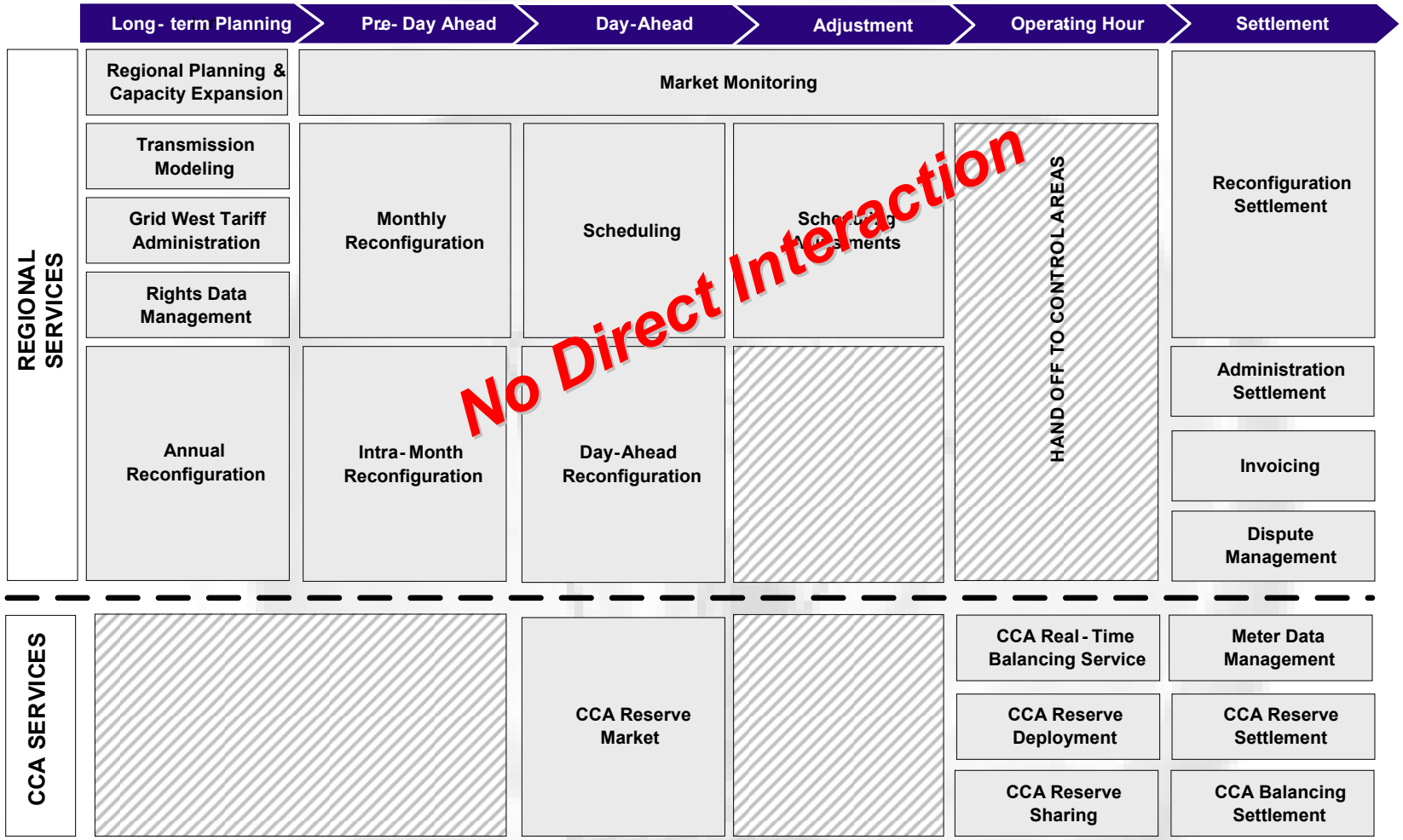
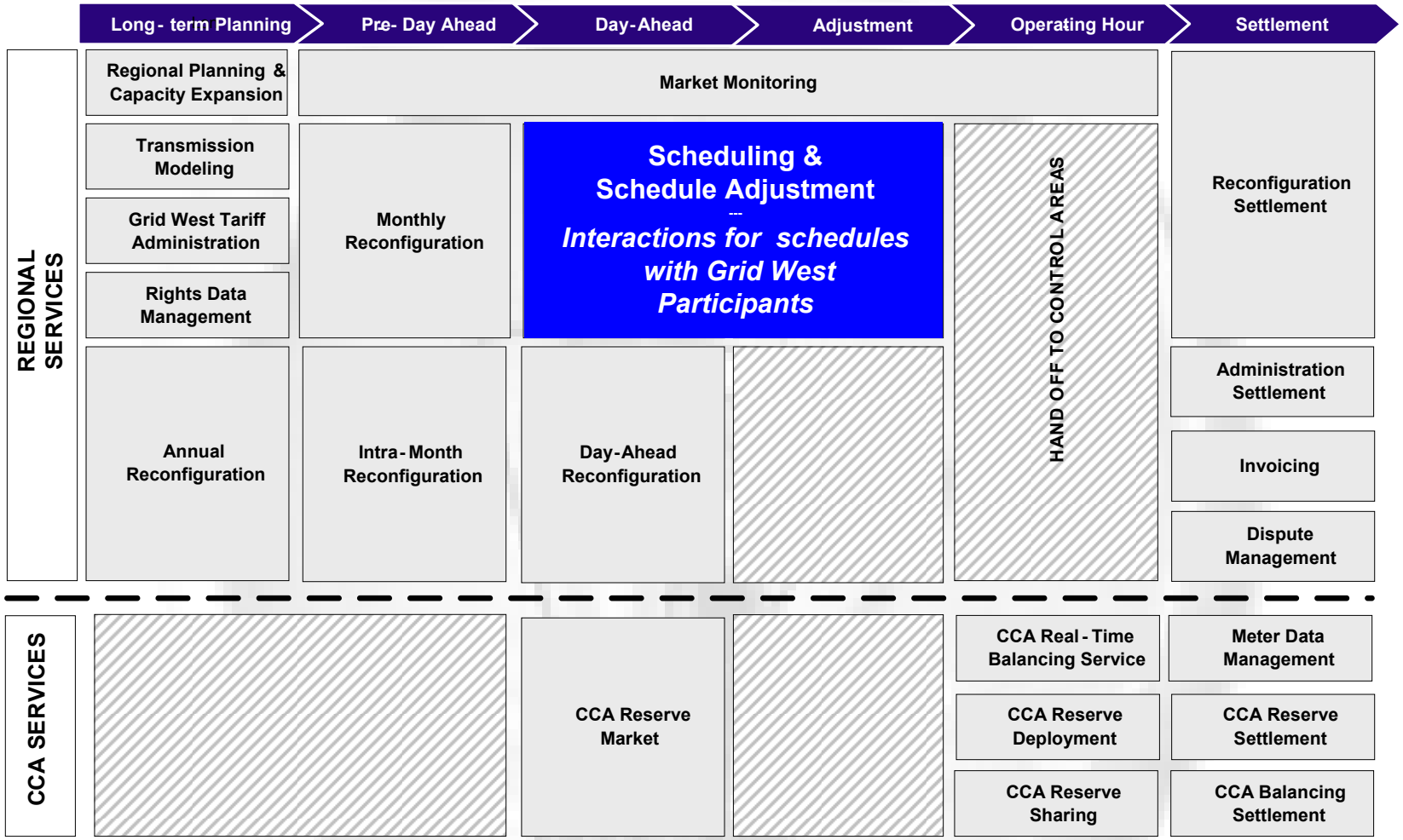
- *Situation*: A party with existing rights does not want to participate in any Grid West market.
  - Scenario #1A – A BPA customer with network service:
    - Situation is unchanged – scheduling and settlement still with BPA.
    - BPA schedules with Grid West for its aggregate responsibility.

Tying It All Together
Scenario #1A



- *Situation*: A party with existing rights does not want to participate in any Grid West market.
  - Scenario #1A – A BPA customer with network service:
    - Situation is unchanged – scheduling and settlement still with BPA.
    - BPA schedules with Grid West for its aggregate responsibility.
  - Scenario #1B – A non-participating control area with point-to-point rights:
    - Transmission rights are unchanged.
    - There will be scheduling interactions with Grid West for transactions with Grid West parties, i.e., interchange confirmation, etc.

Tying It All Together
Scenario #1B

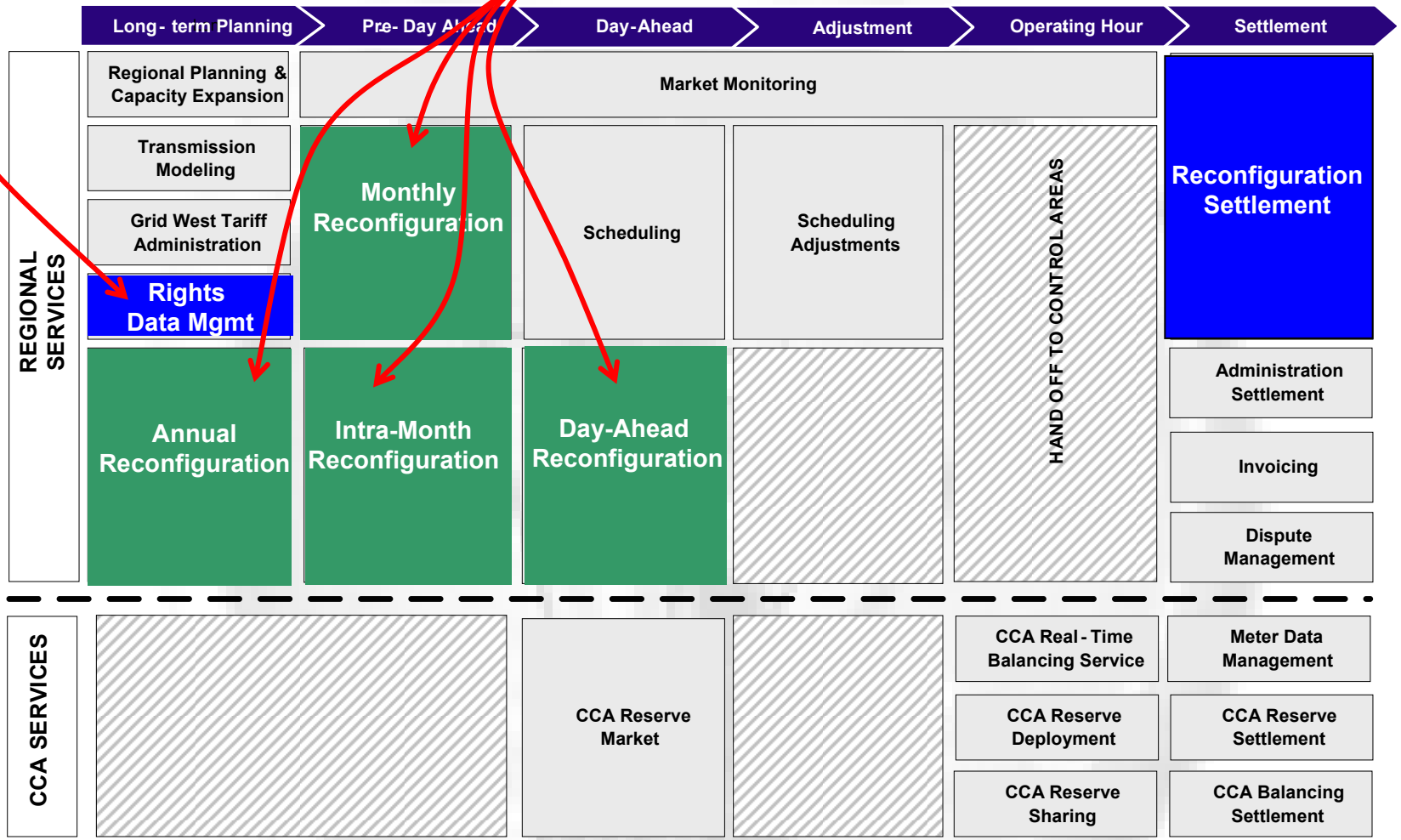


- *Situation: A* party with existing transmission rights is willing to sell some of its rights to others:
- *Options*:
  1. Bilateral Trade – As in the past.
  2. Reconfiguration Market – A one-to-one match of injection and withdrawal points no longer necessary for a trade to occur.
     - Steps:
       - Request certification of existing transmission rights
       - Make IWR Translation Query
       - Offer IWR release in one of reconfiguration markets

Tying It All Together
Scenario #2

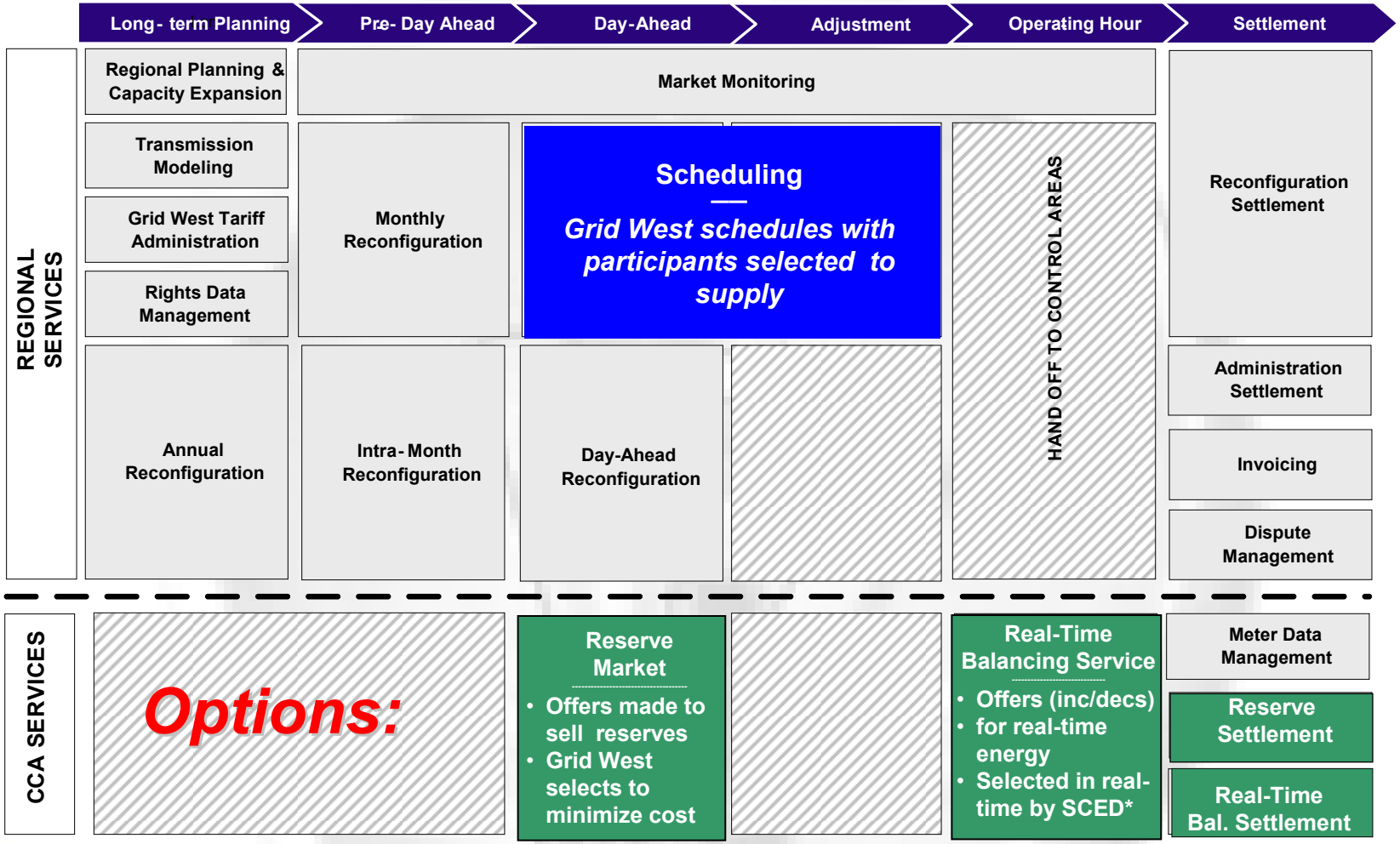
- *Request certification of ETR*
- *Make IWR translation query.*
- *Neither action creates a sale obligation*

- *Choice based on desired term of sale and auction timing*



- *Situation*: A participant with available resources wants to offer them into the CCA's Reserve or the Real-time Balancing Service.
- *Steps*:
  - For resources located within the CCA:
    - Resources must be capable of responding to Grid West control signals.
    - Transmission rights not required to make offer, however transmission availability will affect selection.
    - Selected based on most economic supply.
  - For offered resources located outside the CCA – added points:
    - Dynamic transfer used to for resource control in real-time.
    - Supplier must provide transmission to Grid West boundary if resource is outside the Grid West Managed Transmission System.

Tying It All Together
Scenario #3

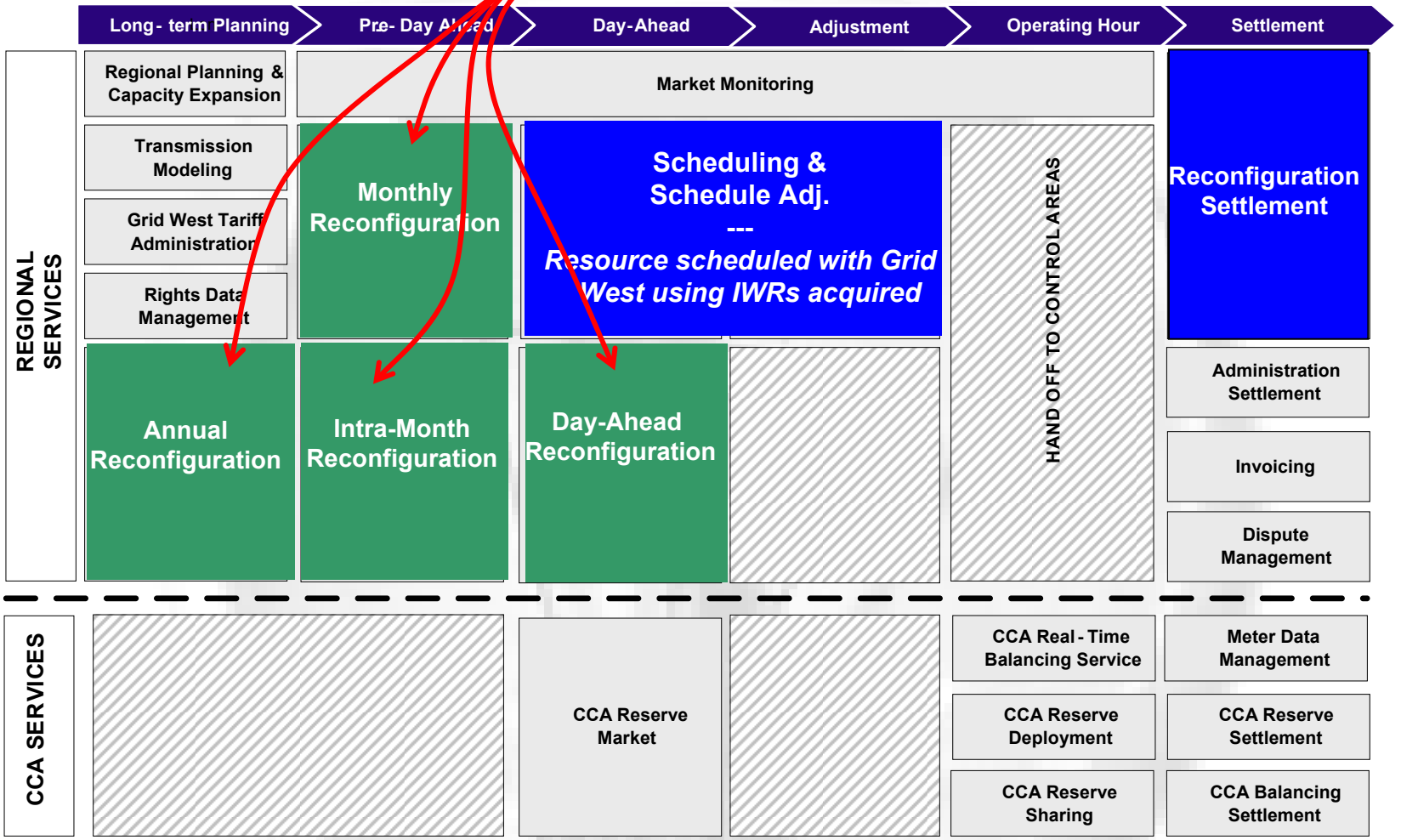


** SCED = Security Constrained Economic Dispatch*

- *Situation:* An LSE wants to buy from a resource not covered by its existing transmission rights.
- *Steps:*
  - Make bid to purchase IWR in appropriate Reconfiguration Service auction.

Tying It All Together
Scenario #4

- ***Choice based on desired term of purchase***

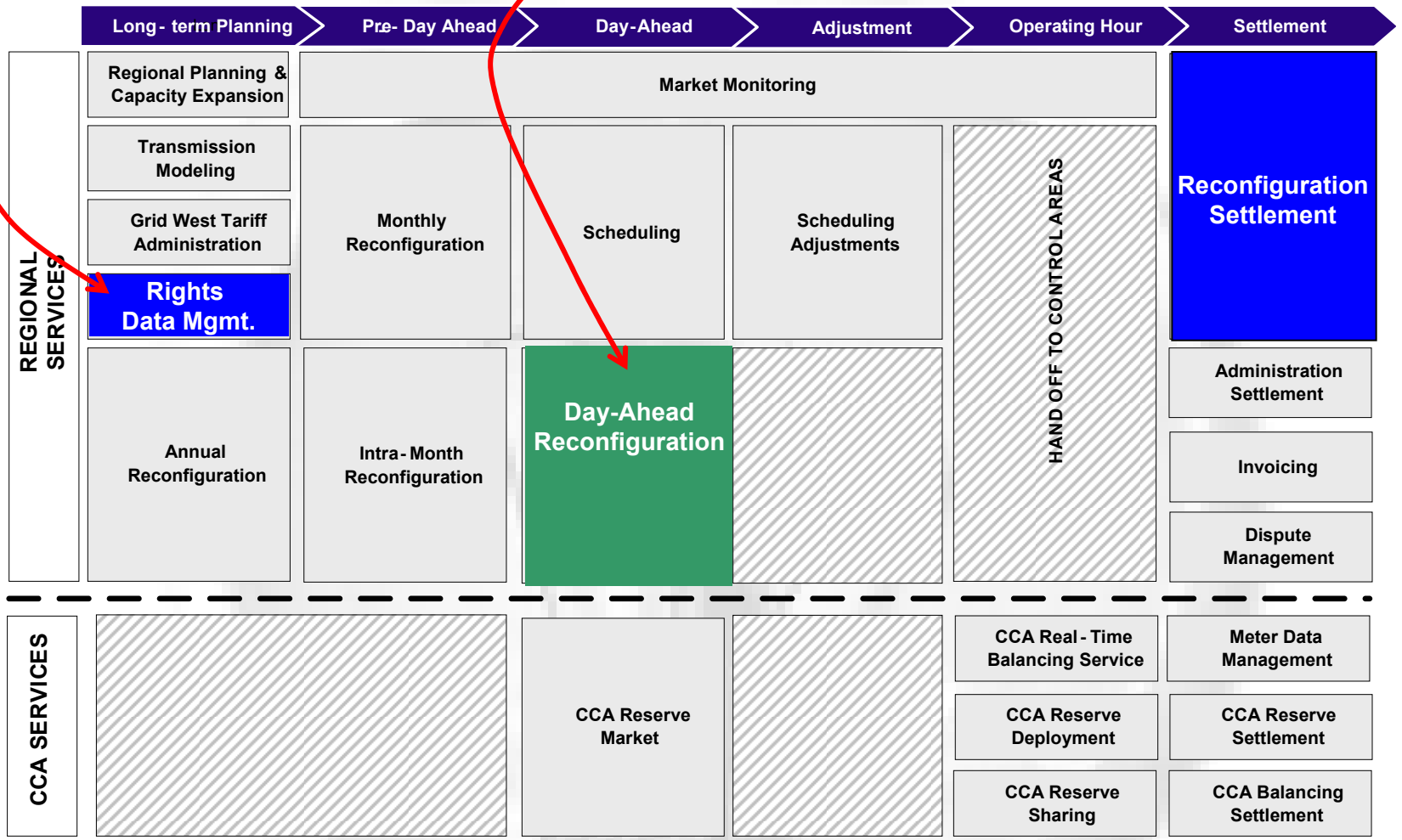


- *Situation:* An Transmission Customer with options for flexible scheduling is willing to restrict is optionality.
- *Steps:*
  - Certification of Existing Transmission Rights (CETR).
  - Offer flexibility release by specifying Intended Retained Rights, i.e., the portion of the optionality to be retained.
  - If flexibility used by RCS, scheduling and schedule adjustment will be restricted adjusted CETR.

Tying It All Together
Scenario #5

- *Request certification of ETR*
- *Does not create a sale obligation*

- *Scheduling Flexibility only offered in Day-Ahead RCS*



Tying It All Together
Feature Comparison

Grid West Basic Features*

- No generation resource adequacy standard imposed
- No centralized unit commitment
- No day-ahead energy market
- Centralized scheduling with balanced schedule requirement
  - Must have physical transmission rights to schedule
  - Existing transmission rights are unchanged
  - No explicit congestion charges
  - New rights issued as physical IWRs
  - Reconfiguration Service with annual, monthly, intra-monthly, and day-ahead auctions

SMD Style RTO Features

- Generation resource adequacy standard imposed
- Centralized unit commitment
- Day-ahead energy market:
- Centralized scheduling without a balanced schedule requirement (may be short)
  - Transmission rights not needed to schedule
  - Conversion of pre-existing transmission rights
  - Explicit day-ahead congestion cost charges
  - Obligation type FTRs
  - Only annual and monthly FTRs auctions

* ***Note: Grid West changes from today underlined.***

Tying It All Together
Feature Comparison

Grid West Basic Features*

- Ex-ante losses for IWRs and pre-existing rights
- Post-day ahead adjustments
- Real-time market for balancing service and only within control areas that voluntarily consolidate
- Market monitoring

SMD Style RTO Features

- Full marginal losses charged ex-post
- No post-day ahead schedule changes
- Real-time Balancing Service, with all deviations between day-ahead and real-time settled
- Market monitoring

* ***Note: Grid West changes from today underlined.***

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- Welcome
- Introduction
- How Did We Get Here?
- TSLG Assignment
- Regional Problems
- Design Overview
- Day-in-the-Life
- Feature Details
- Tying it All Together
- TSLG's Top 8 Issues
- Conclusions
- Question & Answer

TSLG's Top 8
Summary

Issue	Short Description	Resolution
Long Term Requests	• How are long term transmission requests handled under the Capacity Expansion Service? • Is AFC made available at a tariff rate? • What should that tariff rate be?	• Single queue for requests • Pricing working on rate issues
Scheduling	• How does schedule adjustment/rejection work if combined schedules are infeasible? • Is their a seniority order for rights?	• If needed, curtailments made during day-ahead process with LSEs covering load with adjustment schedules before real-time cut off • IWRs are co-equal with pre-existing rights
Activities in Adjustment Period	• How is AFC made available after the daily RCS auction? Is this a first come-first serve option, etc.? • How are the "redirects" from pre-existing contracts handled? • What does a balanced schedule mean and what allowance can be made for contingencies?	• Available on first-come-first-served basis • "Redirects" requests queued with other requests • Balanced submissions and schedule adjustments allowed until real-time cut-off

TSLG's Top 8
Summary

Issue	Short Description	Resolution
Auction Methods	• What is TSLG's recommendation for determining market prices? • Pay-as-bid or clearing-price auctions?	• Clearing-price auctions used for all markets
CCA Markets	• How does the real-time balancing energy market function? (Examples are needed to clarify the details of its operation -- price setting, dispatch decisions, etc.) • How would the consolidating parties' obligations to offer be determined and used? • How can Grid West make sure that the work of the CCA Group and TSLG mesh correctly for the energy and reserve capacity markets?	• Option to make an unrestricted offer or a "reliability only" offer (latter does not set price) • Ramped schedules permitted to minimize balancing requirements (e.g. for load pickup) • Offers are voluntary unless there are insufficient offers to meet needs, then the consolidating parties must offer their proportional share • Work on the CCA was included in Structure contract to achieve consistency

TSLG's Top 8
Summary

Issue	Short Description	Resolution
DA Redispatch	• In reconsidering the day-ahead redispatch market, how can the identified challenges be addressed?	• Offers of scheduling flexibility in the Day-Ahead RCS are used to release AFC made possible by voluntary schedule restrictions • Avoids the difficulties of a partial day-ahead energy market
Implementation Sequence	• How should near term developments (WIT, etc.) be factored into the implementation sequence? • What order gives us the "biggest bang for the buck"?	• Baseline cost estimate will use 24 month implementation sequence • Alternative implementations will be developed as change cases for potential near-term implementation alternatives
Losses	• What loss recovery method should be used with IWRs (i.e. newly issued rights)?	• Loss white paper describes a method for determining loss responsibility of IWR users • IWR loss schedules allocated among the transmission owners

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Conclusions

Based on the conceptual framework the TSLG has concluded…

- Grid West will be able to offer services that no single entity or affiliated entity could offer
- Moving to the Grid West's flow-based physical rights approach to congestion management will be workable and makes good use of transmission capacity
- The effect of Grid West markets and services will be incremental rather than revolutionary
- Implementation can be cost effective

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Wrap-up
Question & Answer